The IRON AGE

April 3, 1958 A Chilton Publication The National Metalworking Weekly

Design Show Feature

Cold-Hobbed Copper: For Complex Shapes A New Approach P. 91

What's Needed to Revive Consumer Durables? – P. 51

The Growing Market For Plastic-Coated Sheet – P. 56

Digest of the Week P. 2-3

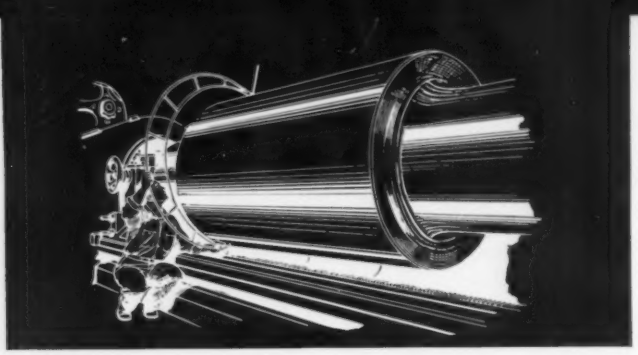
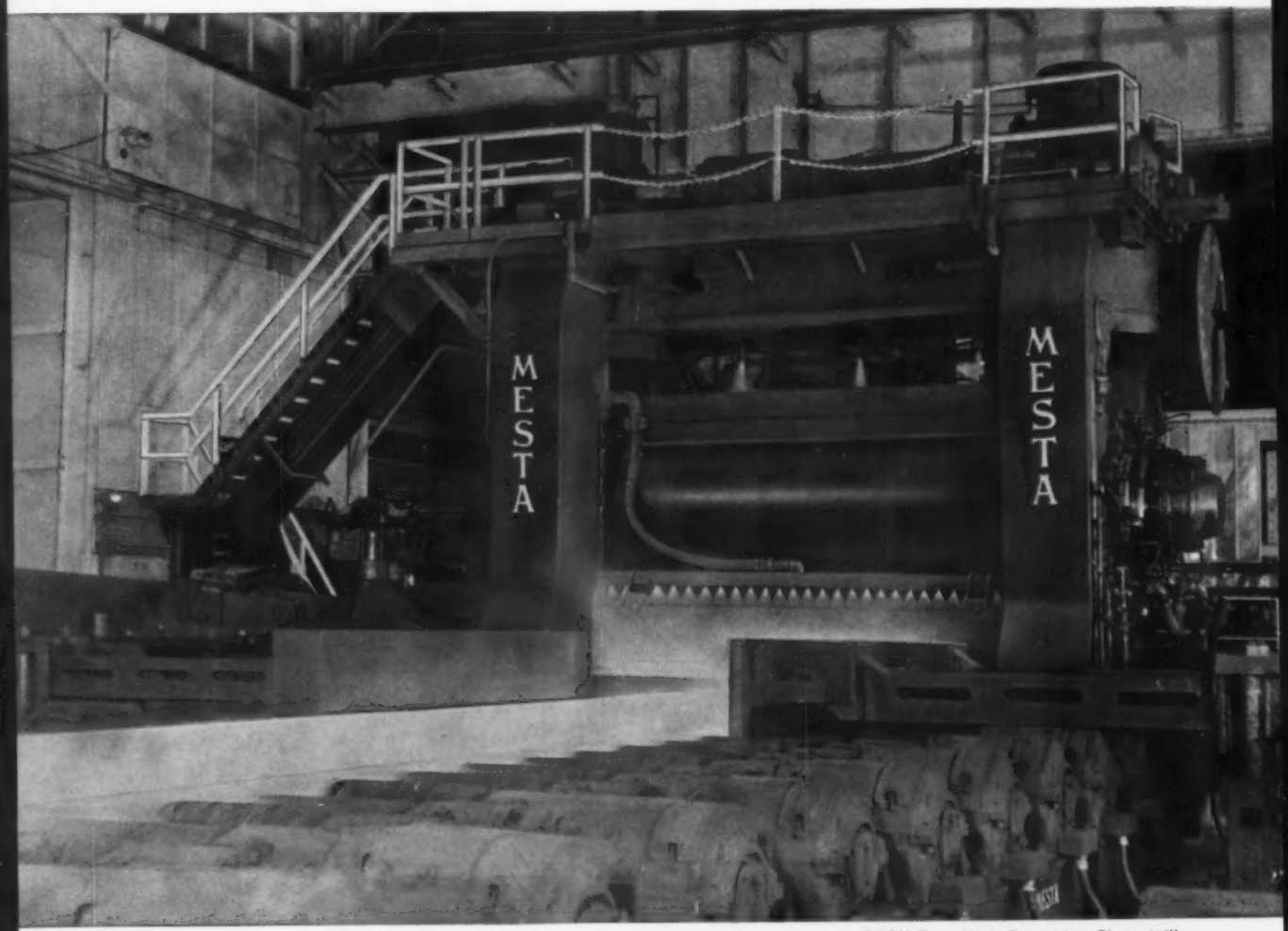


PLATE MILLS *designed and built by*

MESTA



160" Four-High Reversing Plate Mill

MESTA *Machine Company*

Pittsburgh, Penna.

Distributors stock a large variety of Bethlehem products, and their delivery service is fast and dependable.

"Local distributors of steel are vital to our set-up"

Bernard Anderson, Treasurer, Marcus Transformer Co., Inc., Rahway, N. J.

Marcus Transformer Co., Inc., is a name well known to users of electrical equipment. As one means of coordinating production schedules and avoiding manufacturing delays, this Rahway, N. J., firm buys much of its steel from near-by distributors.

"Today," says Bernard Anderson, Treasurer, "customers demand something more than quality alone. We find that we have to be geared for speedy production and early delivery dates—and that's why local distributors of steel are vital to our set-up. Without such distributors and their big stocks and many services, we couldn't operate under our present arrangement.

"We purchase all our angles, channels, plates, and hot- and cold-rolled sheets from distributors, who furnish them cut the way we specify. This enables us to avoid big capital outlay for inventory and shear equipment. It also saves us the space that a large inventory always requires. And when we're pressed for time, we can usually get overnight service from the distributors we call.

"Another point: to a certain extent, every job we do is a custom job. Hence our month-to-month needs cannot be wholly anticipated. It's a great help to be able to order by phone, if necessary, and know that the steel will be at our door when we want it."

HERE'S WHAT THE DISTRIBUTOR OFFERS YOU. Bethlehem sheets, bars, shapes, plates, tool steel, and other steel products are stocked by distributors equipped to serve you well. Not only can the distributor be your "storage space," but he shoulders the "cost of possession"—items such as insurance, handling costs, etc. Because of his specialized machinery, he can do many things you need—like cutting, sawing, slitting. And he's always able to make delivery fast!

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Bethlehem Pacific Coast Steel Corporation, San Francisco

BETHLEHEM STEEL

Call the distributor—your Shopping Center for Steel

THE IRON AGE
Chestnut and 56th Sts.
Philadelphia 39, Pa.
SHerwood 8-2000

GEORGE T. HOOK, Publisher

EDITORIAL STAFF

TOM C. CAMPBELL, Editor-in-Chief
GEORGE F. SULLIVAN, Editor

Managing Editor — E. C. Beaudet
News-Markets Editor — J. B. Delaney
Asst. News Mkts. Ed. — R. D. Raddant
Technical Editor — J. J. Obrzut
Machinery Editor — E. J. Egan, Jr.
Metallurgical Editor — P. M. Unterweiser
Materials Editor — Wm. Czygan
Engineering Editor — R. H. Eshelman
Art Director — T. S. Peaby

Associate Editors: F. J. Starin, P. J. Cathey, R. Schulin, F.T.P. Plimpton, Jr. Assistant Editor: J. A. Moore. Regional Editors: K. W. Bennett, Chicago; T. M. Rohan, Cleveland; H. R. Neal, Detroit; G. G. Carr, New York; R. R. Kay, Los Angeles; G. J. McManus, Pittsburgh; G. H. Baker, R. M. Stroupe, N. R. Regeimbal, Washington. Correspondents: F. L. Allen, Birmingham; N. Levenson, Boston; R. M. Edmonds, St. Louis; J. Miller, San Francisco; R. Kazarian, Buffalo; D. A. Coughlin, Seattle; F. Sanderson, Toronto; F. H. Harley, London, England; Chilton Editorial Board: Paul Wooton, Washington representative.

WASHINGTON EDITORIAL OFFICE
Washington 4 ... National Press Bldg.

BUSINESS STAFF

Production Manager — Warren Owens
Director of Research — Oliver Johnson
Circulation Mgr. — W. M. Coffey
Promotion Manager — Richard Gibson
Asst. Research Dir. — Wm. Laimbeer

REGIONAL BUSINESS MANAGERS

Chicago 1. T. H. Barry, W. R. Pankow, 360 N. Michigan Ave. — Randolph 6-2166
Cleveland 15 ... Robert W. Watts, 930 B. F. Keith Bldg. — Superior 1-2860
Columbus 15, Ohio ... Harry G. Mumm, LeVeque-Lincoln Tower — Capital 1-3764
Dallas 6 ... H. E. Mott, J. W. Sangston, 189 Meadows Bldg. — Emerson 8-4751
Detroit 2 ... W. J. Mulder, 103 Pallister Ave. — Trinity 1-3120
Los Angeles 28 ... R. Raymond Kay, 2420 Cheremoya Ave. — Holly'd 3-1882
New York 17 ... C. T. Post, I. E. Hand, 100 E. 42nd St. — Oxford 7-3400
Philadelphia 39 — B. L. Herman, J. A. Crites, W. E. Carr, Chestnut & 56th Sts. — Sherwood 8-2000
Pittsburgh 22 ... T. M. Fallon, 1502 Park Bldg. — Atlantic 1-1830
San Francisco 3 ... Don May, 1355 Market St. — UNderhill 1-9737
W. Hartford 7 ... Paul Bachman, 62 LaSalle Rd. — Adams 2-0486
England ... Harry Becker, 15 Gratton St., Altrincham, Cheshire

One of the Publications Owned and Published by Chilton Company, Chestnut & 56th Sts., Philadelphia 39, Pa.

OFFICERS & DIRECTORS

Joseph S. Hildreth, Ch. of the Board
G. C. Buzby, President

Vice-Presidents: P. M. Fahrendorf, Harry V. Duffy, George T. Hook, Robert E. McKenna, Leonard V. Rowlands; Treasurer, William H. Vallar; Secretary, John Blair Moffett; Directors: Maurice E. Cox, Frank P. Tighe, Everit B. Terhune, Jr., Russell W. Case, Jr., John C. Hildreth, Jr.—Comptroller, Stanley Appleby.

Indexed in the Industrial Arts Index and the Engineering Index.

BPA NBP

Copyright 1958 by Chilton Company

THE IRON AGE, published every Thursday by CHILTON COMPANY, Chestnut & 56th Sts., Philadelphia 39, Pa. Entered as second class matter, Nov. 8, 1932, at the Post office at Philadelphia under the Act of March 3, 1879. Price to the metal-working industries only or to people actively engaged therein, $5 for 1 year, $8 for 2 years in the United States, its territories and Canada. All others $15 for 1 year; other Western Hemisphere countries, $25; other Foreign Countries, $35 per year. Single Copies 50¢. Annual Review Issue $2.00. Cable: "Ironage," N. Y.

The IRON AGE

April 3, 1958—Vol. 181, No. 14

Digest of the Week in

★Starred items are digested at right.

EDITORIAL

The Smart Consumer: Still Unpredictable Is He ... 7

NEWS OF INDUSTRY

★**Special Report:** Durables Industry Works on Consumer Psychology ... 51
U. S. Steel Launches Big Ad Effort ... 53
★Who's Ahead in Auto Labor Talks? ... 54
★Plastic and Metal Join Forces ... 56
New Coloring Process ... 57
★First Space Flight Due in 1959 ... 58
★Aluminum Price Cut ... 60
The IRON AGE Salutes ... 65
Men in Metalworking ... 81

DESIGN SHOW FEATURES

★How Cold Hobbing Shapes Parts ... 91
★Reinforced Plastics Solve Problems ... 94
★Aluminum Impacts Open New Areas ... 98
★Tips on Spinning Stainless ... 101
★Get Results With Sintered Steel ... 104

NEWS ANALYSIS

Newsfront ... 49
Report to Management ... 67
Automotive ... 68
★Washington ... 73
★West Coast ... 75
★Machine Tool ... 77

MARKETS & PRICES

★**The IRON AGE Summary** ... 135
★**Purchasing** ... 136
Steel Products Markets ... 138
Index to Prices ... 139
Iron and Steel Scrap Markets ... 140
Nonferrous Markets ... 144
Clearing House ... 156

REGULAR DEPARTMENTS

Letters ... 9
Fatigue Cracks ... 11
Exhibits, Meetings ... 13
Free Literature ... 108
Technical Briefs ... 117
Materials Roundup ... 124
New Equipment ... 126

INDEX TO ADVERTISERS ... 163

NEWS ARTICLES

CONSUMER DURABLES

Reluctant Buyers—Sales of some products lag even behind replacement market. Psychological as well

as economic factors affect the situation. Consumers are deferring plans in face of uncertain conditions. P. 51

AUTO LABOR TALKS

Who's on Top?—This could be the auto companies' year to call the turn on new contract terms. The business outlook will be the deciding factor in outcome of bargaining sessions. P. 54

MANNED SPACE FLIGHT

May Come in 1959—First craft built for round trip with pilot to outer space is under development. X-15 is half-plane, half-rocket, relies heavily on stainless steel to combat high temperatures. P. 58

ALASKAN DEVELOPMENT

Gets More Attention—Industrial activity in Alaska will affect Canada

Metalworking

SPECIFYING DESIGNS: The men on the cover know that success of a new part, or a system, depends on its design (for photo details see p. 11). Improvements in methods and materials give the engineer a widening scope of design possibilities. P. 91

and eleven states in western U. S. Proposed new road, replacing the Alcan Highway, would improve flow of commerce. P. 75

TAX CUTS

Up to Public — Ike's advisors favor a tax cut, but Congress wants to tap public attitude first. Spring recess will see lawmakers out in the grass roots. Results will determine course of action. P. 73

DESIGN SHOW FEATURES

COLD HOBBING

Shapes Intricate Parts—It's only a single piece of copper, but a multiple-cavity magnetron holds many lessons on treating and shape of metal. Why? Because it was cold hobbed to get accuracy that cannot be matched by any other method. P. 91

REINFORCED PLASTICS

For Heat Strength — They're proving the best answer to many of today's biggest design headaches and the only course on some. Reinforced phenolics prove superior to most aircraft structural materials in comparing tensile strengths on a strength-to-weight basis. P. 94

ALUMINUM IMPACTS

New Areas for Design—A single press stroke forms a dense cold-forged structure to close tolerances. If your product can be made of aluminum and also can be made by extrusions, there's probably no better way to produce it. P. 98

SPINNING STAINLESS

Helpful Pointers — Successful spinning depends on a working knowledge of both spinning techniques and the special characteristics of the stainless grade you're working on. Each of the two general types of spinning has its own advantages. P. 101

SINTERED STEEL

Tailor-Made Properties—Sintering is the heart of the process, not just another heat treating job. To make the best use of sintered metal parts, the design engineer should take pains to specify the properties he wants. P. 104

MARKETS & PRICES

PLASTIC-COATED SHEET

Join Forces—Combining properties of metal and plastics creates a valuable group of metalworking materials. Automotive and construction fields have great potential in this field. P. 56

PRICE BREAK

Aluminum Off—The first break in the primary aluminum price in 17 years was an unexpected 2¢ cut by Aluminium Ltd. There are a number of ideas in the trade on why the cut, and what it will mean to the industry. P. 60

MACHINE TOOL

Military Spending — Under the current setup any money not spent by the Armed Forces for machines in a fiscal year must go back to the Treasury. There are bills in the hopper of both houses of Congress to correct this situation. P. 77

STEEL PICKUP?

Some Are Hopeful—The steel business is at low ebb. But some professional marketers are looking for a reversal of the downtrend in the near future. P. 135

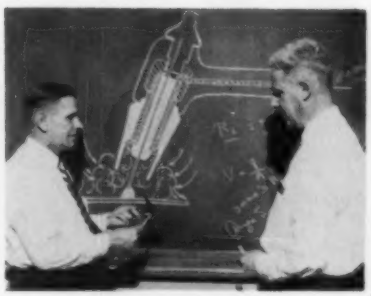
STEEL MILL EQUIPMENT

Intense Sales Drive — Sellers of mill machinery are out to convince steel plants that this is the time to modernize and expand. They stress cost savings and quality advantages of new equipment. P. 136

NEXT WEEK

WELDING

Where Do We Stand? — We've long been exposed to a wide range of claims and counterclaims on gas-shielded metal arc welding. Next week's Welding Show feature will present facts, straighten out warped notions and fallicies.



an important weapon in America's arsenal

THE WORLD'S LARGEST STEAM DROP HAMMER

Under a contract with the United States Government, Erie Foundry Company has recently delivered the eighth 50,000 lb. Steam Drop Hammer, the largest ever built.

Here are some of this all-steel hammer's dimensions:

Weight: 1,650,000 lbs.
Height, overall: 45 ft.
Height, floor line to top: 28½ ft.

The hammer was completely machined and assembled for factory pre-testing (a standard Erie Foundry Company procedure on all machines) in Erie Foundry's plant—a modern factory which is equipped with new giant machine tools to handle such large work.

Of special interest to hammermen is the 25 to 1 anvil ratio. The added anvil weight more fully utilizes this hammer's tremendous impact energy of 850,000 foot pounds. Like all Erie hammers, all stressed parts on the 50,000 lb. machine are *steel*.

With eight 50,000 lb. Erie Steam Drop Hammers in service and stand-by, our country is ready to forge the larger component forgings needed in the weapons of today and tomorrow.

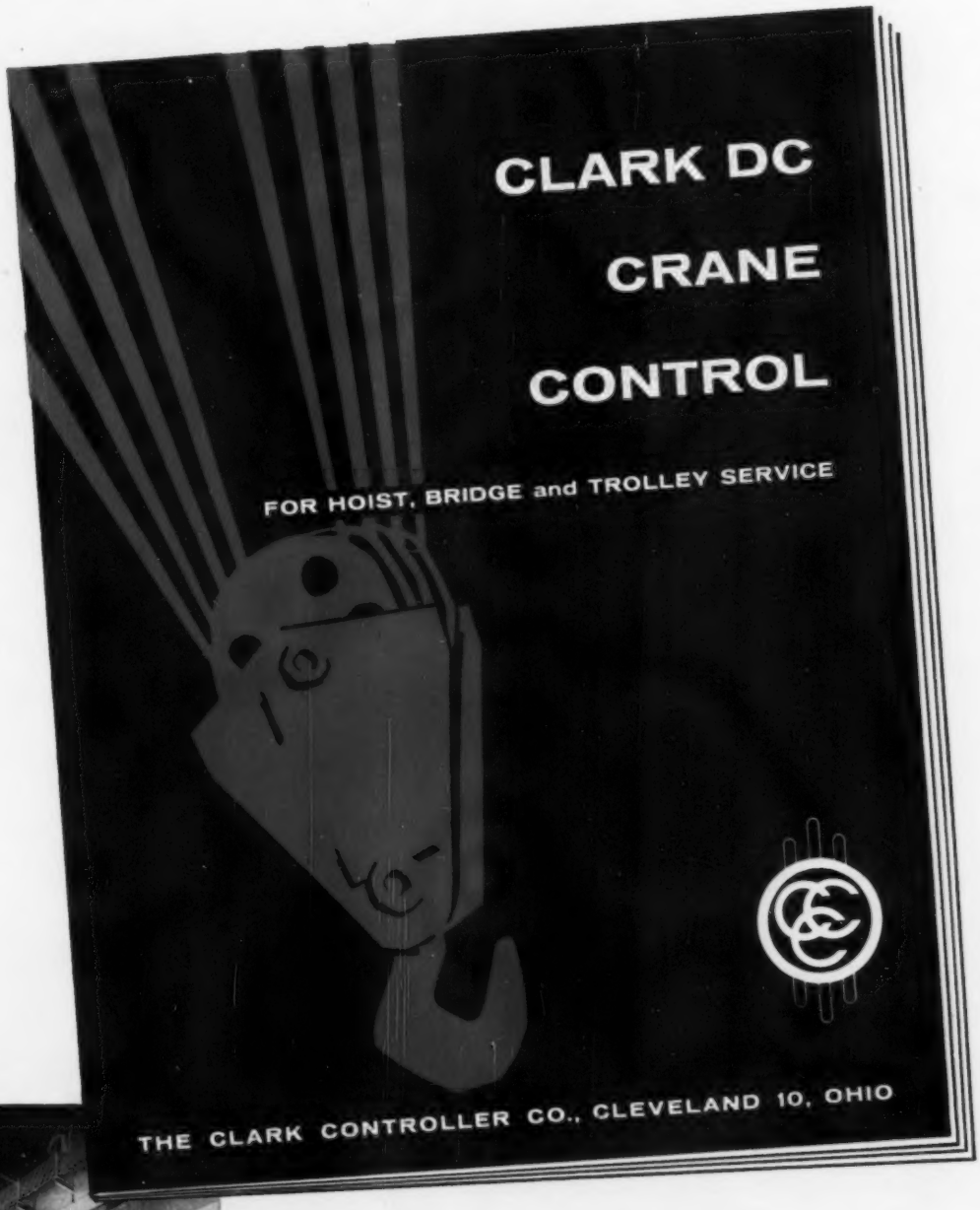
the greatest name in forging hammers

ERIE

in our 61st year

WRITE FOR BULLETIN 355

ERIE FOUNDRY CO. ERIE, PA.



Clark has engineered and built control systems for all sizes and types of DC cranes, covering all five NEMA I.C1-42.01 Service Classifications. The hot ladle crane illustrated is an example of Group V, Steel Mill and Heavy Industrial.

Interested in DC Cranes?

This 20 page book outlines the basic principles of DC crane control, and provides the essential technical information you should have to select the controls best suited to your particular DC crane requirements. Profusely illustrated with photographs, charts and diagrams, the book explains in detail the circuits and components required for safe, dependable crane operation. As a major supplier of DC control of all types for over 30 years, The Clark Controller Company has pioneered and developed many of the advancements in modern DC crane control. This book provides an authoritative report of these developments.

Write today for your copy of this informative book. Ask for Bulletin 9100.

The **CLARK** **CONTROLLER** *Company*

Everything Under Control 1146 East 152nd Street • • Cleveland 10, Ohio

IN CANADA: CANADIAN CONTROLLERS, LIMITED • MAIN OFFICES AND PLANT, TORONTO

Better Tools...

BEGIN WITH

SHARON QUALITY

ALLOY STEELS

What's new in the way of garden tools? This tool caddy, for one thing, and Sharon metallurgists know all about it.

Sharon has been supplying carbon, stainless and special alloy steels to garden and farm implement manufacturers for more than 50 years and they know the industry and its requirements.

So, if you're in the business of farm and garden tools, isn't it just good business to become acquainted with . . .Sharon Quality Steels?

SHARONSTEEL

SHARON STEEL CORP.

SHARON, PENNSYLVANIA

The Smart Consumer Still Unpredictable Is He

Just when business, government, and politicians think they have him tagged, analyzed, and completely cased, The Consumer gives them the slip.

And what's funny about the whole thing: The Consumer is also businessman, government man, worker, and politician. But with his consumer hat on he thinks cunningly and differently when the bait is out.

Right now he is squirreling his money. When he isn't doing that he is looking for—and finding—bargains. It isn't always price alone he shops for: He has an uncanny way of finding quality, top service, and sales integrity.

Today The Consumer is king pin: He is likely to stay crowned for quite a spell. In him are the seeds of "correction" as well as the seeds of inflation. He plays it by ear many times and throws the economists on the ropes.

He crosses up rules laid down in pretty volumes which forecast how he will jump. He jumps but not always the way the experts have him figured.

The Consumer is fair game for the salesmen who know how to sell. Our consumer includes buyers of heavy goods, machinery, metals, non-durables—and even gimcracks.

Both political parties are bending the knee to The Consumer. Business in the guise of seller is staking fortunes on service and products for business in the guise of The Consumer.

Labor is playing big pal to The Consumer to curry his support for higher wages and fringes. Politicians everywhere are knocking each other over in their coy approaches to him.

Sometimes The Consumer gets the feeling that he is being fingered, taken for granted, bamboozled, or being treated as a laboratory nonentity.

This may be one of those times. While he may be a little scared to see so much unemployment, his main characteristic now is to look around a little before signing. While in that position he is going into hock less, paying up faster than he is spending and socking—collectively—into savings much more than he did a year ago.

Stick close to the trail of The Consumer. Pay him his homage. Watch his confidence. When it regains its right level he will release his money as swiftly as he is garnering it now.

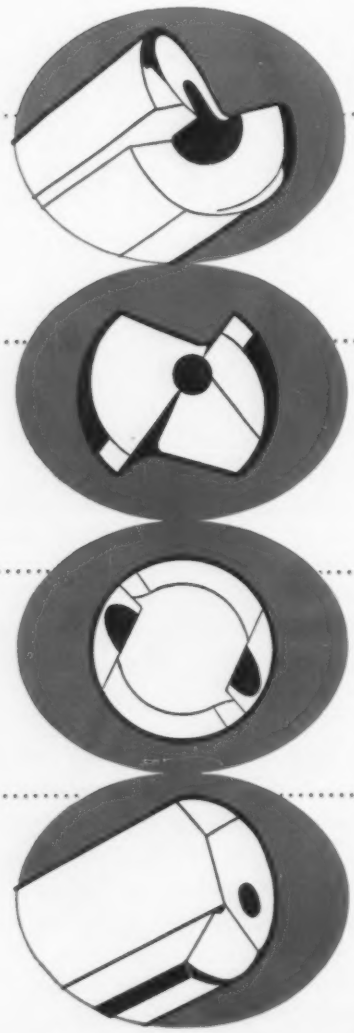
He will pull us out of this recession at the time he chooses! It won't be the experts' date.

Tom Campbell

Editor-in-Chief

NOW... THE ONLY COMPLETE LINE OF GUN DRILLING TOOLS

Enables you to specify an application-engineered carbide gun drill or gun reamer to suit your particular production, material and finish requirement. Every tool in the precision Star line has been wear-life proven in quantity runs on production parts in both the Star Cutter gun drill development laboratory and metal-working plants.



® Starbore DRILL

Has the exclusive trepanning action. Produces precision through-holes from the solid in cast iron, bronze, aluminum and some stainless steel parts. Two-flute carbide design.

Starbore CENTER-CUT DRILL

Produces no pin. For precision blind holes, holes that intersect cross holes, and applications where a pin is not desirable. Two-flute carbide design.

Starbore REAMER

A gun reamer that provides the ultimate in finish and wear life. For enlarging previously drilled or cored holes to finish size in one operation. Two-flute carbide design.

Star GUN DRILL

A gun drill of conventional design for drilling precision holes from the solid in steel. Made in sizes from 3/16-in. to 1½-in. diameter. Single flute carbide design.

Starbore Gun Drilling Services . . . Automated setups for large production runs. Quick-change fixtures for job-lot work. Send blueprints for prompt quotations.

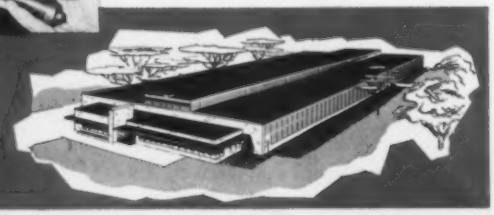
Write for this catalog file giving complete information on Starbore gun drilling tools.

Star Cutter Company

Originators of Accurate Unground-Form Hobs

24500 GRAND RIVER AVE., BOX 376, FARMINGTON, MICHIGAN

Telephone: (Detroit, KEnwood 3-4500



Recession Medicine

Sir — Last evening my husband and I read Mr. Campbell's recent editorial, "Our Self Reliance—What's Happened to It?" After finishing it my husband remarked, "I wonder why we Americans can't take care of this depression ourselves."

I asked how. "I still have a good job," he answered, "and so do millions of others. If every man who's working would guarantee to spend a hundred extra every month—or even fifty—in the buying of useful needed things it would do a lot."

We though of a dozen things we have put off doing because we MIGHT be going to have a depression. Don't you think that if a million people did more spending it would help? Then maybe we wouldn't have to be "spoon fed good news" and have to depend on "mother government" (and our taxes), as Mr. Campbell points out, to wipe away our tears and pay our bills.—Harriet Dolby, Elgin, Ill.

Sir—Have read your editorial in the Feb. 27 issue, "Our Self Reliance What's Happened to It?" It seems to me there is nothing wrong with our self reliance. The real trouble is that the landlords and tax collectors have taken all our chips.

When two out of three players in a game are knocked out, the game must come to a halt. Presently labor has a purchasing power of 30¢ on a dollar, capital of about 70¢ on a dollar and the landlords and tax collectors have $2 for a dollar's worth of goods with which to inflate the cost of living further for capital and labor.

You say now is a good time to start. It certainly is about time that economic action committees got to work on muzzling the political action committees.—G. Szmak, Economist, Economic Welfare Council, New York.

Handling Tensions

Sir—I would appreciate receiving two copies of "Are Tensions Getting You Down" which appeared in the March 13 issue of The IRON AGE.

This is a very excellent article and, as most of us have to contend with tensions, it provides a handy mirror for daily personal inspection. —J. McLennan, Sales Mgr.—Construction Products, Frost Steel and Wire Co., Ltd., Hamilton, Canada.

Address Wanted

Sir—I am interested in contacting Mr. Kendall K. Hoyt, Executive Director of the newly formed Association of Missile and Rocket Industries, referred to on p. 70 of The IRON AGE for Feb. 27, 1958. I shall appreciate it if you will tell me where I can contact Mr. Hoyt.—W. O. Spangler, Sales Mgr., Jet Engine Div., The Budd Co., Phila.

▪ Mr. Hoyt has offices in the National Press Bldg., Washington 4, D. C.—Ed.

"You have just ten minutes to change yourself into an alert, dynamic salesman."

PHILLIPS OR SLOTTED
TAPPING SCREWS
BY Southern

in STEEL, ALUMINUM, OR STAINLESS
FLAT, ROUND, OVAL, PAN, TRUSS, HEX
Types: A, B, C & F

Southern makes the tapping screws you need for faster, more profitable production... Rigid quality-controlled manufacturing methods in our own plant, employing only U.S.A. workers and materials, means that you can safely place full confidence in Southern as your one source for fasteners.

Over one billion Southern screws in stock. Four Southern warehouses mean service with a capital S!

Wire or phone your requirements, or write Southern Screw Co., P. O. Box 1360, Statesville, N.C.

A, B, C & F TAPPING SCREWS
DOWEL SCREWS • MACHINE SCREWS & NUTS • CARRIAGE BOLTS • STOVE BOLTS • WOOD SCREWS • SPEAKER SCREWS
HANGER BOLTS • WOOD KNOB SCREWS • DRIVE SCREWS

WAREHOUSES: NEW YORK, CHICAGO, DALLAS, LOS ANGELES

Southern SCREW COMPANY
STATESVILLE • NORTH CAROLINA

"I Called L. B. FOSTER CO.

WE GOT THE PIPE"

and the alloy pipe, and seamless carbon pressure pipe —all in the same one shipment

Pipe buyers *are* finding hard-to-get pipe items in L. B. Foster warehouse stocks —and are getting immediate deliveries on all their needs. And "all their needs" now includes just about every type of pipe—seamless, seamless carbon pressure pipe, seamless alloy, prime tested and structural—in all sizes ⅛" thru 36" and now aluminum and PVC pipe, valves, fittings. For the finest service available, try your nearest Foster office . . . call today for the pipe you need.

Now in Stock!
Welding Fittings & Flanges
(Carbon Steel, Alloy, PVC)

PIPE · RAILS · STEEL-SHEET PILING · PIPE PILES · H-BEARING PILE · VALVES & FITTINGS

SINCE 1901

L. B. FOSTER CO.

PITTSBURGH · NEW YORK · ATLANTA · CHICAGO · HOUSTON · LOS ANGELES

Success Story

Design and development men are a patient, tenacious group. Give them a problem and they'll stay with it until it's solved.

The three men on this week's cover are studying a radar magnetron anode that proves our point.

They are Alex Phillips (middle), Dept. Head, Mechanical & Development Section, Magnetron Development Laboratory, Raytheon Mfg. Co. and methods engineers John Libby and Richard J. Clark.

Mr. Phillips authored the article beginning on p. 91 of this Design Show issue of The IRON AGE. Titled, "How Cold Hobbing Shapes Intricate Parts" it traces 15 years of intensive and painstaking development work—all aimed at sucsessfully forming copper anodes by displacing metal mechanically.

As in all ventures we're grateful to many people for their contributions to the published story. Among them of course are Author Phillips and others at Raytheon. A bow also to the Copper & Brass Research Association for its cooperation. And, last, but not least, thanks to Marlowe Kirkendall of Raytheon whose Extachrome camera work made possible our four-color cover photograph.

Jobolony Translated

Ever wonder about those Shangri-La phrases you read in the advertisements aimed at getting engineers, technicians, and experienced secretaries. We mean the ones that promise to wrap up the world in an attractive package for the successful applicants.

Well, Worthington Corp. has performed what we consider a service for job hunters. As part of a direct mail campaign to recruit personnel they've spoffed the employment space ads.

Here, as noted in the Reporter of Direct Mail Advertising, are some of the terms and their between-the-lines definitions:

Challenging problems—**"Now that we've made it, we don't know what to do with it."**

Responsible assignments—**Work.**

Diversity—**"We're trying to find something that we can make money on."**

Promotion from within—**The boss is loaded with relatives.**

Unique climate of teamwork prevails—**"We don't speak to each other, so we get along fine."**

Top-level position—**A title in lieu of a raise.**

Cultural and entertainment facilities—**Movies and bars available.**

Full quota of golfing, swimming, riding, etc.—**"We're really running a country club. Manufacturing is just our hobby."**

Job interest—**Good looking secretary.**

Less than an hour from—**You'll need a jet.**

Your talent is the key —**"We ain't promising you a thing."**

New opportunities — **"We need help."**

Management potential—**Know how to write your name so that no one can read it.**

Stimulating assignments — **Office party.**

"Ever have one of those days when everything seems to go right?"

WHY MACHINE IT?

Use FLOTRUSION*, a new and revolutionary method of cold flowing various metals into tubular forms of all shapes and sizes.

. . . meets demand for high production of parts previously requiring expensive and lengthy machining and polishing to hold dimensional tolerances and finishes.

. . . in many cases form in one piece a part formerly requiring several components.

. . . maintain the same wall thickness with smaller or larger diameters **on the same tube.**

. . . form cylindrical sections with heavy wall sections at one or both ends, or in the center to provide for bearings, threads, weldments, etc.

. . . require only the exact amount of material necessary to produce the parts.

. . . on heavy sections, maintain the same O.D. as the tube body, with smaller I.D., or larger O.D. with same I.D., or both.

. . . increase tensile strength and improve grain flow by cold working and eliminating heat-treating.

Lockheed PITOT MAST

The flotrusion process is readily adaptable to the construction of many diversified parts used in the missile and aircraft industries for both airborne and ground equipment.

Our staff of specialized engineers is available to show how this highly flexible process can—**REDUCE COSTS, SAVE WEIGHT,** and **SIMPLIFY** your **PRODUCT.**

Your inquiry is invited.

FLOTRUSION, INC.
1733 FLOWER STREET
GLENDALE 1, CALIFORNIA
A Division of DARCO INDUSTRIES, INC.

87 OF AMERICA'S "FIRST HUNDRED" CORPORATIONS ARE WHITING CUSTOMERS

metalworking
Metalworking companies increase plant capacity... lower costs with these WHITING PRODUCTS
Trambeam Overhead Systems, as shown above, handle materials and components in production ... move finished products to storage or shipping. More profitable use of floor space is assured when goods move overhead on Trambeam. For fast point-to-point transport or complete area coverage, Trambeam is engineered specifically to your operation.
11

Here's how to "clear the decks" for efficiency and profits

See how Whiting Trambeam Systems handle materials and components overhead to keep floors and aisles clear for more efficient production . . . move finished products to storage or shipping. This new, 32-page, pocket-size booklet shows the advantages of Trambeam's point-to-point transport or complete area coverage. Tells how Trambeam can be custom-engineered to your exact requirements.

There's other helpful information here, too . . . on Whiting Cranes . . . on Trackmobile, the "Road-to-Rail Convertible" that speeds handling of freight cars . . . on every Whiting product used in your type of industry. Write today for a copy of "Working for Profit". *Whiting Corporation, 15601 Lathrop Avenue, Harvey, Illinois.*

WHITING TRAMBEAM

MANUFACTURERS OF CRANES; TRAMBEAM HANDLING SYSTEMS; TRACKMOBILES; FOUNDRY, RAILROAD AND CHEMICAL PROCESSING EQUIPMENT

COMING EXHIBITS

Industrial Development Show — Apr. 7-11, Coliseum, New York. (Woods, Donegan & Co., Inc., 48 West 48th St., New York 36.)

Design Engineering Show — April 14-17, International Amphitheatre, Chicago. (Clapp & Poliak, 341 Madison Ave., New York 17.)

Welding Show—Apr. 14-18, Kiel Auditorium, St. Louis. (Banner & Greif, 369 Lexington Ave., New York 17.)

Powder Metallurgy Show — April 21-23, Sheraton Hotel, Philadelphia. (Metal Powder Assn., 420 Lexington Ave., New York 17.)

Tool Engineers Show — May 1-8, Convention Hall, Philadelphia, (American Society of Tool Engineers, 10700 Puritan Ave., Detroit 38.)

Western Material Handling Show—May 8-10, Great Western Exhibit Center, Los Angeles. (Information: 2809 Sunset Blvd., Los Angeles 26.)

Southwestern Metal Show — May 12-16, State Fair Park, Dallas. (American Society for Metals, 7301 Euclid Ave., Cleveland 3.)

Foundry Show—May 19-23, Public Auditorium, Cleveland. (American Foundrymen's Society, Golf & Wolf Rds., Des Plaines, Ill.)

MEETINGS

APRIL

Concrete Reinforcing Steel Institute —Annual meeting, Apr. 6-12, The Boca Raton Hotel, Boca Raton, Fla. Society headquarters, 39 S. Dearborn St., Chicago.

Wire Reinforcement Institute, Inc. —Annual spring meeting, Apr. 7-8, Hotel Boca Raton, Boca Raton, Fla. ,Society headquarters, National Press Bldg., Washington.

Industrial Fasteners Institute—Annual meeting, Apr. 8-10, Boca Raton Hotel, Boca Raton, Fla. So-

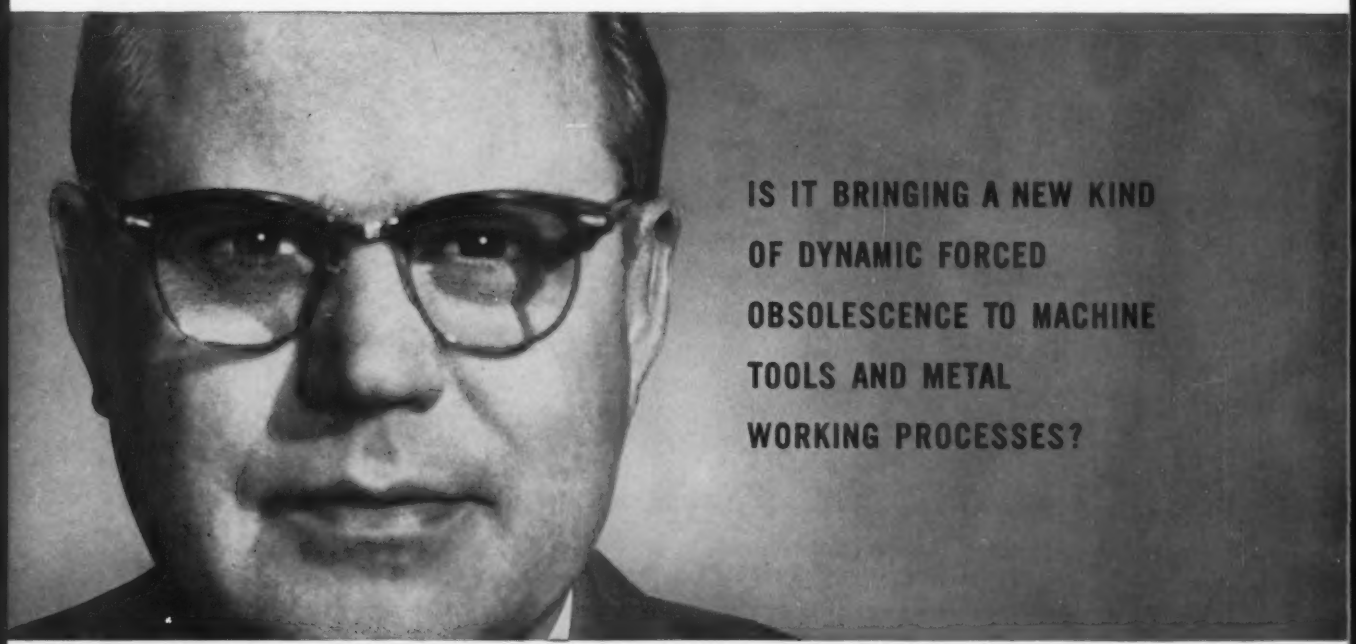
(Continued on P. 16)

52100 · PETERSON · 52100
PETERSON · 52100 · PETER
00 · PETERSON · 52100 · PE
ERSON · 52100 · PETERSON
52100 · PETERSON · 52100
PETERSON · 52100 · PETER
00 · PETERSON · 52100 · PE
ERSON · 52100 · PETERSON
52100 · PETERSON · 52100
PETERSON · 52100 · PETER
00 · PETERSON · 52100 · PE
ERSON · 52100 · PETERSON
52100 · PETERSON · 52100
PETERSON · 52100 · PETER
00 · PETERSON · 52100 · PE
ERSON · 52100 · PETERSON
52100 · PETERSON · 52100
PETERSON · 52100 · PETER
00 · PETERSON · 52100 · PE
ERSON · 52100 · PETERSON

Looking for the world's most complete stock of 52100 steel tubes and bars? You've come to the right spot . . . . . .

PETERSON STEELS, INC.
Union, New Jersey
Detroit, Michigan Chicago, Illinois

The bright new era belongs to those who



C. R. DE VLIEG, Executive Vice President, DeVlieg Machine Company.

Here at Fair Street, we think that the answer unquestionably is "yes."

We have felt it already, as you must have, too, in your business. The evidence is everywhere indicating that we are racing into the greatest industrial revolution of all time. We are backing our own conviction with the dollars it takes to build the new highly efficient plant you see pictured here.

Technological progress of the last 10 years more than equals any previous 50 years in the history of mankind.

And still, relentless research goes on. One breakthrough into new areas of science and engineering is quickly followed by another. New materials, new methods, new processes, higher accuracy control and most significant of all, *vast product changes affecting every business are in the making.*

From it all is emerging what virtually amounts to a new philosophy in running a metalworking business. The basic tenets now are clear to those who expect to control their own destiny in the bright new, bitterly competitive era ahead.

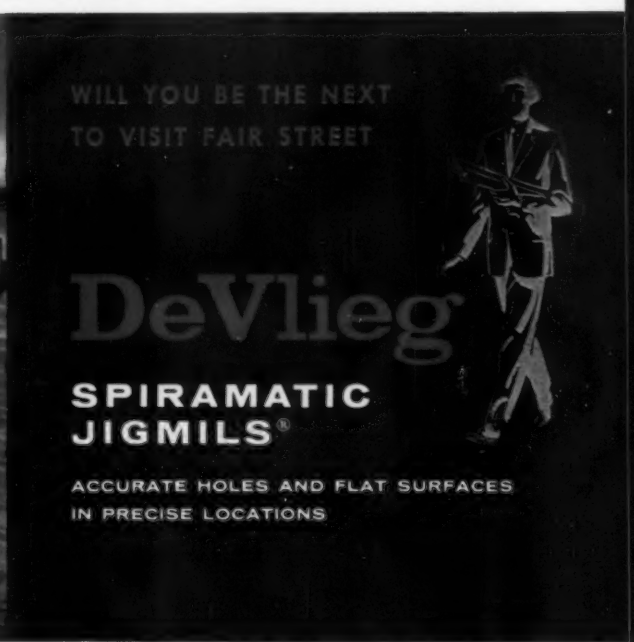
The old "needs" now are becoming "musts." Greater flexibility in design and production to meet competitive product changes can no longer be ignored. The need for shorter time cycles and lower inventories is imperative. Already, old established theories of obsolescence are being knocked into a cocked hat. And the time is fast approaching when no shop can afford costly boring jigs and fixtures or the intolerable months of lead time required to manufacture them.

DE VLIEG MACHINE COMPANY, 450 FAIR STREET

plan for it . . .

SOME OF OUR JIGMIL USERS

Allis Chalmers Mfg. Co.
Aluminum Co. of America
American Can Co.
American Machine & Foundry Co.
Avco Manufacturing Corp.
Barber-Colman Co.
Bendix Aviation Corp.
Boeing Airplane Co.
Borg-Warner Corp.
Brown & Sharpe Mfg. Co.
Bucyrus-Erie Co.
Cameron Machine Co.
Carbide & Carbon Chemicals Co.,
A Div. of Union Carbide and Carbon Corp.
Carrier Corp.
Caterpillar Tractor Co.
Chance Vought Aircraft, Inc.
Chrysler Corp.
Clark Equipment Co.
Continental Can Co., Inc.
Continental Motors Corp.
Control Instrument Co., Inc.
Convair, A Division of General Dynamics Corp.
Curtiss-Wright Corp.



New 130,000 sq. ft. Jigmil plant to be completed in June.

Fortunately, our amazing Jigmil supplies answers to many of the new "must solve" problems involved in design flexibility, time cycles, and costly inventories. Many case histories show that savings usually cover its cost in a few months. Savings resulting from reduced inventory alone often are enough.

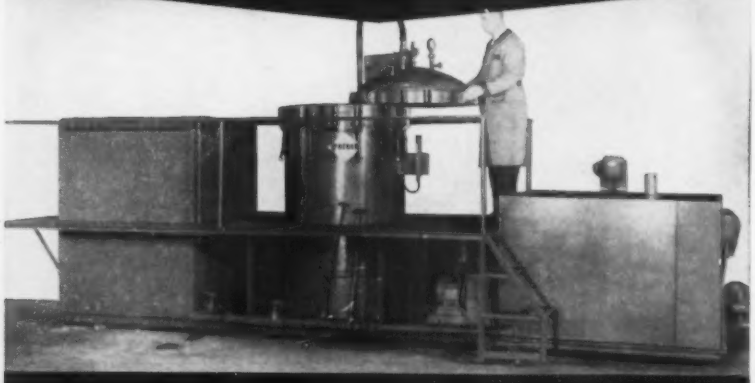
Few people believe the claims we make for this machine. We know they sound fantastic. But 90% of the men who come to Fair Street to see a demonstration buy Jigmils.

Now while you and we have a breather period, will you come, too? Come simply to watch. The Jigmil does the selling. And we promise answers that will pay off handsomely for you—*proved in advance.* A Deferred Payment Plan is available, if desired.

FERNDALE • DETROIT 20

Dana Corp.
Douglas Aircraft Co., Inc.
Eaton Mfg. Co.
Fairbanks Morse & Co.
Fairchild Engine & Airplane Corp.
Food Machinery & Chemical Corp.
Ford Instrument Co., Div. of Sperry Corp.
Ford Motor Co., Aircraft Engine Div.
General Electric Co.
General Motors Corp.
Goss Printing Press Co.
Holley Carburetor Co.
Ingersoll-Rand Co.
International Business Machines
International Harvester Co.
Jeffrey Mfg. Co.
Joy Mfg. Co.
The Glenn L. Martin Co.
National Machinery Co.
North American Aviation, Inc.
Northrop Aircraft, Inc.
The Oliver Corp.
Speco Division, Kelsey-Hayes Co.
Sperry Gyroscope Co.
Thompson Products, Inc.
United Aircraft Corp.
Warner & Swasey Co.
Western Electric Co., Inc.
Westinghouse Electric Corp.

Lease Equipment Like This



To Impregnate Castings Like These

for a Fraction of a Penny per Pound

Solve all porosity problems in ferrous and non-ferrous castings with *leased* Prenco Impregnation Equipment operating right in your plant. No capital expenditure is necessary. Total cost to you can be as little as a small fraction of a penny per pound of castings treated.

Prenco Equipment, using fast-acting, deep-penetrating Porlox Seal, is production proved . . . widely used by major foundries and die casting plants. Superior results are achieved even with castings of microscopic porosity.

Let Prenco engineers make a complete analysis of your products so that specific recommendations and cost estimates can be made. Mail the coupon below for initial information.

PRENCO

PRENCO PRODUCTS, INC., 507 E. 10 MILE ROAD, HAZEL PARK, MICHIGAN

Name_____

Title_____

Company_____

Address_____

City_____ Zone_____ State_____

Please send complete information on Prenco Impregnation Equipment. I am interested in

☐ Leasing

☐ Purchasing

☐ Product analysis

IA-4

EXHIBITS, MEETINGS

(Continued from P. 13)

ciety headquarters, 1517 Terminal Tower, Cleveland.

Copper And Brass Warehouse Assn., Inc. — Annual convention, Apr. 13-16, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, 1900 Arch St., Philadelphia.

The American Zinc Institute — Annual meeting, Apr. 14-15, The Chase-Park Plaza Hotels, St. Louis, Mo. Society headquarters, 60 E. 42nd St., New York.

The Metallurgical Society of AIME —41st Openhearth steel and blast furnace, coke oven, and raw materials conference, Apr. 14-16, Statler Hotel, Cleveland. Society headquarters, 29 W. 39th St., New York.

Lead Industries Assn. — Annual meeting, Apr. 15-16, Chase-Park Plaza Hotels, St. Louis, Mo. Society headquarters, 60 E. 42nd St., New York.

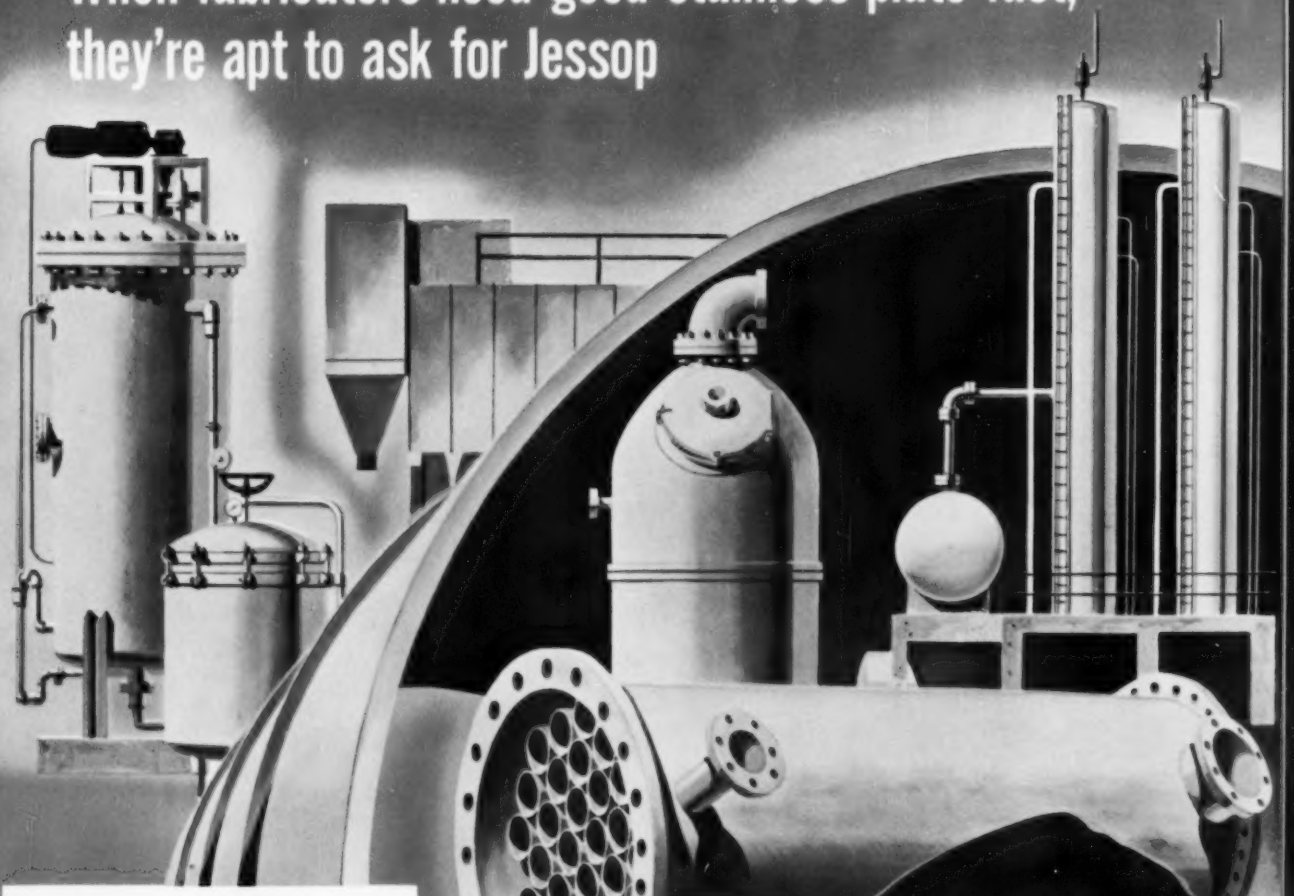
Steel Shipping Container Institute —Annual meeting, Apr. 14-18, Kenilworth Hotel, Miami Beach, Fla. Society headquarters, 600 Fifth Ave., New York.

Institute of Environmental Engineers—Annual meeting, Apr. 17-18, New Yorker Hotel, New York. Society headquarters, 9 Spring St., Princeton, N. J.

Scientific Apparatus Makers Assn. —Annual meeting, Apr. 20-24, El Mirador Hotel, Palm Springs, Calif. Society headquarters, 20 N. Wacker Dr., Chicago.

American Home Laundry Mfrs. Assn.—Annual meeting, Apr. 22-24, Boca Raton Club, Boca Raton, Fla. Society headquarters, 20 N. Wacker Dr., Chicago.

When fabricators need good stainless plate fast, they're apt to ask for Jessop



To be more explicit, fabricators are apt to specify Jessop stainless steel plate for the following very good reasons: First of all, they don't have to wait in line for delivery. Jessop operates a compact, highly adaptable stainless plate department—all under one roof from melting to finishing. Schedules can be adjusted overnight to fill a rush order. And they get *good* plate. Jessop's advanced new chemical control equipment and techniques guarantee that. So if you are a fabricator and need good stainless plate fast, send your next order to Jessop. You'll be glad you did. Write for literature.

JESSOP

STEEL COMPANY, WASHINGTON, PA.

OFFICES IN PRINCIPAL CITIES

Wholly-owned Subsidiaries: Jessop Steel of Canada Limited, Wallaceburg, Toronto
Jessop Steel International Corp., Chrysler Building, New York, New York
Green River Steel Corporation, Owensboro, Kentucky

You wouldn't cut out paper dolls with a hedge clipper!!

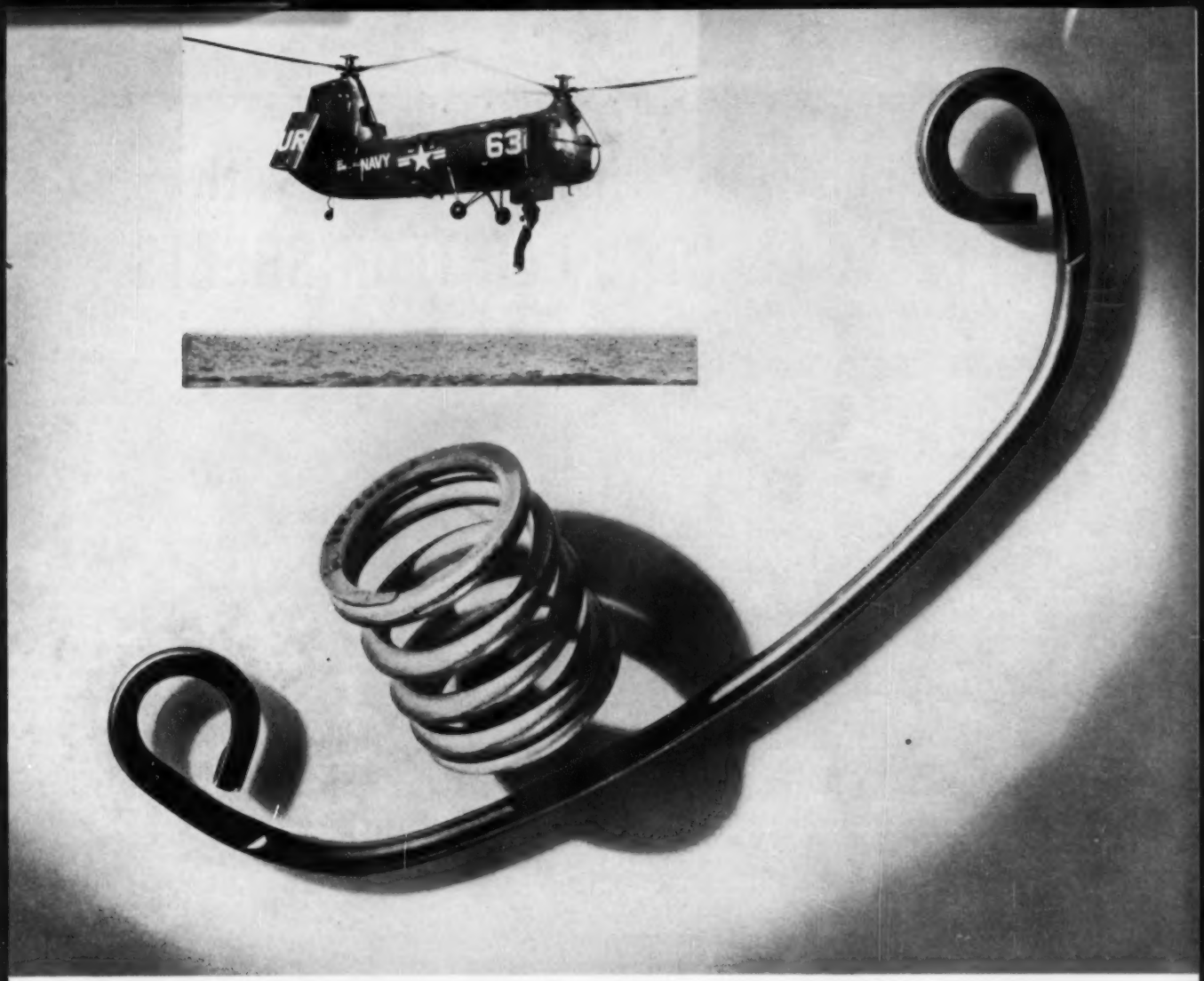
Then why shear 6-inch wide material with a 10-foot shear?

Cutting a small piece of light metal, plastic or rubber on a big shear is even more expensive than it is exasperating. Yet many shops, out of necessity, tie up big shears with small work.

That problem is solved by the New Lodge & Shipley 24" Speed Shear. Specially designed for fast cutting of small pieces, it has a capacity of ⅛" x 24" mild steel. Its unique work table is provided with holes which allow fast set-up of guides, templates and protractors for production of straight-side blanks at speeds up to 120 strokes per minute.

A 24" Speed Shear may easily pay for itself merely in freeing a big shear from wasteful small jobs. Investigate its possibilities in your plant. For detailed Bulletin No. PS-12, write: **The Lodge & Shipley Co., 3073 Colerain Ave., Cincinnati 25, Ohio**

Lodge & Shipley



Up with the Whirlybirds . . .

What helps this helicopter hover? It's an engineering principle — angle of tilt of rotor blades and speed of revolution. What's at the heart of the rotor assembly? Among other things, this rugged spring and tension bar made by an A.S.C. Division. The same exacting "aircraft quality" that produces these and hundreds of other high duty aircraft springs is available to manufacturers in any industry whose standards demand the best.

Write for a copy of "How to Solve Your Spring Design Problems" to learn how early consultation with the spring manufacturer results in improved design and performance.

Associated Spring Corporation

General Offices: Bristol, Connecticut

Wallace Barnes Division, Bristol, Conn. and Syracuse, N. Y.
B-G-R Division, Plymouth and Ann Arbor, Mich.
Seaboard Pacific Division, Gardena, Calif.
Cleveland Sales Office, Cleveland, Ohio
Raymond Manufacturing Division, Corry, Penna.
Ohio Division, Dayton, Ohio
F. N. Manross and Sons Division, Bristol, Conn.
San Francisco Sales Office, Saratoga, Calif.
William D. Gibson Division, Chicago 14, Ill.
Milwaukee Division, Milwaukee, Wis.
Dunbar Brothers Division, Bristol, Conn.
Wallace Barnes Steel Division, Bristol, Conn.

Canadian Subsidiary: The Wallace Barnes Co., Ltd., Hamilton, Ontario and Montreal, Quebec

5805 © 1958 ASSOCIATED SPRING CORPORATION

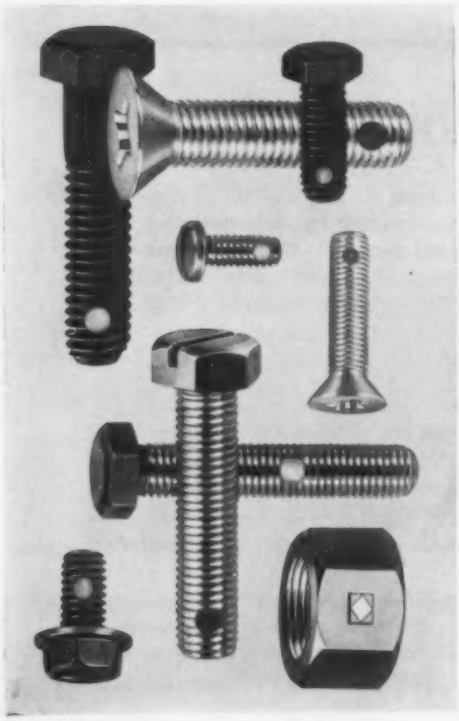
"We've built a better mouse trap with REPUBLIC ELECTRO PAINTLOK SHEETS"

"If we expected the world to beat a path to our door," continues Mr. Coughanor, "we knew every detail of design and material in the Self Sett Trap had to be exactly right. As a result, extensive tests have been conducted which prove design efficiency. And experience has proved Republic Electro Paintlok is the best steel sheet we can buy for economy, long life, and excellent paint-holding qualities. The combination of these factors gives us the best, safest, most foolproof product on the market."

This enthusiasm for Republic Electro Paintlok® is echoed by many other product manufacturers faced with a wide range of forming and application problems. The reason is the chemically treated zinc surface of Republic Electro Paintlok which leaves the mill in prime condition for painting, and won't crack, flake, or peel under any forming operation permitted by the base metal.

These features of Electro Paintlok protect the applied finish of completed products—holding it tightly and restricting corrosion to the point of damage if it should be scratched through.

If you want to "build a better mouse trap" in your product field, it will pay you to get all the facts on versatile Republic Electro Paintlok. Contact your Republic representative or mail coupon.



BETTER OVER-ALL PERFORMANCE WAS MADE POSSIBLE through the use of Republic Titanium in the manufacture of these hemispheres by Alloy Products Corporation, Waukesha, Wisconsin. Used for special aeronautical applications, completed spheres provide light weight without impairing safety; strength to contain 2,000 p.s.i.; extreme corrosion resistance to chemically active contents. Beyond providing product advantages, Republic Titanium is easy to draw, pierce, and weld. Little change in fabricating procedure is required as compared with other construction materials. Send coupon for data.

BETTER SERVICE FROM BOLTED ASSEMBLIES subject to impact and vibration can be secured when they are fastened with Republic Nylok® Bolts and Nuts. The resilient nylon pellet imbedded in the body of bolt or nut forces a tight metal-to-metal lock between opposite mating threads. Pellet is unaffected by age or moisture and permits both adjustment and re-use without loss of holding power. Lock is secure even if fastener is not seated. For details, send coupon.

says Mr. E. S. Coughanor,
President, Self Sett
Mouse Trap Company,
Cleveland, Ohio

OPERATION OF THE SELF SETT MOUSE TRAP, as indicated here by Mr. Coughanor, depends on both ingenious design and corrosion resistant materials. A series of automatic doors and pivoted ramps leads the rodent to his destruction in a tank of water. The special coating on Republic Electro Paintlok holds painted finish securely to provide long-term corrosion resistance required to maintain trap operating efficiency.

BETTER COAL "FINE" RECOVERY RATE WAS SECURED when the cotton fabric on this coal-cleaning plant disc-type filter was replaced with a finely woven mesh of Republic ENDURO® Stainless Steel. In addition to doubling efficiency, ENDURO provides far longer service. Republic ENDURO is available in all standard forms, finishes, and analyses. For full information, mail coupon.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

REPUBLIC STEEL CORPORATION
Dept. IA-5251
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Please send more information on:

☐ Electro Paintlok ☐ Titanium
☐ ENDURO Stainless Steel ☐ Nylok Fasteners

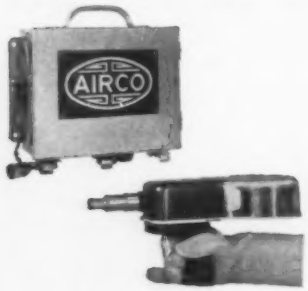
Name _____ Title _____

Company _____

Address _____

City _____ Zone ____ State _____

ANYWHERE A MAN CAN GO
THE NEW AIRCOMATIC® MIGet CAN WELD



Aircomatic MIGet Welding Gun and Control Panel. MIGet, 200 amperes, air cooled, handles one-pound reel of aluminum wire 3/64" to 1/16" and two-pound reel of hard wire .030" and 3/64" dia.

- **welds all weldable metals**
- **carries its own reel of wire**
- **operates up to 50 feet from control panel —with control panel 100 yards from power supply**

The new Aircomatic MIGet now makes it possible to weld practically anywhere a man can reach, climb or crawl.

The MIGet features its own compact, built-in reel of wire, high portability and overall light weight. Components of both the Aircomatic MIGet gun and Aircomatic MIGet Control Panel are miniaturized and simplified with sub-assemblies packaged to be replaceable as units.

Your welder may not be working in a crow's nest, but if the job is hard to reach, he'll reach it more easily than ever before and do the job faster with a new Aircomatic MIGet in hand.

Send today for technical literature on the Aircomatic MIGet. Or call your nearest Air Reduction Sales Office.

SEE IT AT THE AWS WELDING SHOW

AIRCO®

Offices and dealers in most principal cities

AIR REDUCTION SALES COMPANY

A division of Air Reduction Company, Incorporated
150 East 42nd Street, New York 17, N. Y.

On the west coast — Air Reduction Pacific Company
Internationally — Airco Company International
In Cuba — Cuban Air Products Corporation
In Canada — Air Reduction Canada Limited
All divisions or subsidiaries of Air Reduction Company, Inc.

AT THE FRONTIERS OF PROGRESS YOU'LL FIND AN AIR REDUCTION PRODUCT • Products of the divisions of Air Reduction Company, Incorporated, include: **AIRCO** – industrial gases, welding and cutting equipment, and acetylenic chemicals • **PURECO** – carbon dioxide – gaseous, liquid, solid ("DRY-ICE") • **OHIO** – medical gases and hospital equipment • **NATIONAL CARBIDE** – pipeline acetylene and calcium carbide • **COLTON** – polyvinyl acetate, alcohols, and other synthetic resins.

SHIP VIA UNITED—
THE WORLD'S LARGEST
365-m.p.h. CARGO LIFT

UNITED offers you the world's largest 365-m.p.h. cargo lift, because every DC-7 in the fleet carries 9000 pounds of air freight. Add to this the hefty capacity of United's DC-6A Cargoliners plus the extra cargo space on *every* passenger Mainliner® and you have the most flexible air freight service available. And when you ship United, you take advantage of such features as Reserved Air Freight (guaranteed space), direct airways to 80 cities, door-to-door service and fleet-wide radar dependability. Also, you enjoy the close cooperation that's a matter of pride with United, where extra care is basic policy.

For service, information or free Air Freight booklet, call the nearest United Air Lines Representative, or write Cargo Sales Division, United Air Lines, 36 South Wabash Avenue, Chicago 3, Ill.

UNITED AIR LINES ®

IT COSTS NO MORE FOR EXTRA DEPENDABILITY—ON UNITED, THE RADAR LINE

See How the Quality

CAN GIVE YOUR

Today, quality tips the scales of competition. Customers demand top value for every dollar. That's why the built-in quality advantages of these special Armco Steels can help your metal products sell easier, faster.

Armco supplies *more than just steel.* It's the "something extra" that products need to stand out in today's highly competitive *quality* market. Here's how:

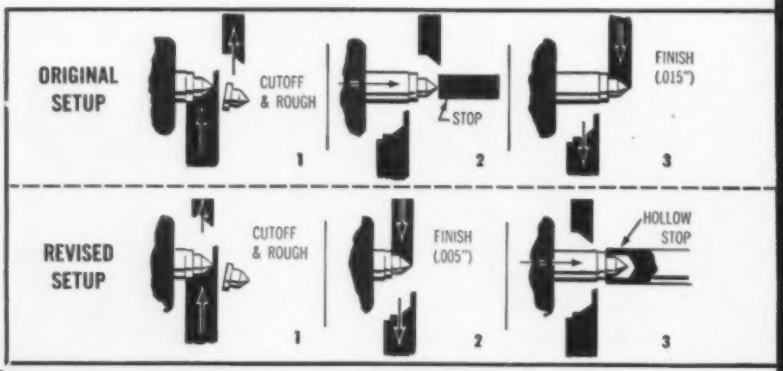
Every Armco Special Steel offers extra quality advantages because each was especially developed to do jobs that ordinary steels can't do. You can select the specific grade of special steel that delivers the *exact* product features your customers want.

With your product needs in mind, check over these Armco Special Steels. Perhaps one or a combination of them can help give your products an edge over competition. For *complete* information, fill in and mail the coupon or call your nearby Armco Sales Office.

ARMCO STAINLESS STEELS, in sheet, strip, bar, and wire, endow your products with lasting beauty, rugged endurance, and stubborn resistance to corrosion, heat, and wear.

***Above:* MUSCULAR MAST**

Customers buy strong, weather-resisting TV antenna masts and towers made of zinc- and aluminum-coated Armco Welded Steel Tubing because they offer ample strength, durability, and lasting good looks.

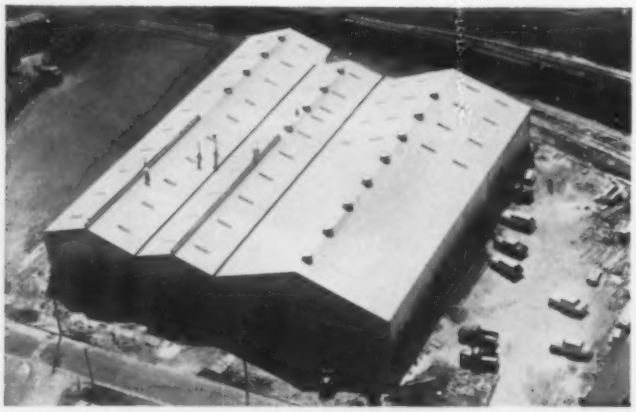


***Below:* FOR DURABLE DRYERS**

Parts for home laundry dryers made of Armco ALUMINIZED STEEL Type 1 offer important sales features for quality-conscious appliance buyers. They defy heat and corrosion; improve performance by reflecting radiant heat more efficiently.

***Right:* MAINTENANCE COST 75% LESS**

"With our building made of Armco ALUMINIZED STEEL, maintenance cost is about 75 per cent less than for other kinds of structures." This building owner's own words point out a strong sales advantage of Armco ALUMINIZED STEEL Type 2 —low maintenance.



Advantages of These Special Armco Steels

PRODUCTS AN EDGE ON COMPETITION

ARMCO ALUMINIZED STEEL TYPE 1, a special hot-dip aluminum-coated steel, is an excellent reflector of radiant heat, defies combinations of heat and corrosion, stays strong.

ARMCO ALUMINIZED STEEL TYPE 2, also hot-dip coated with aluminum, gives outdoor products extra long life. Tests show the aluminum coating outlasts a commercial zinc coating on unpainted galvanized steel sheets 3-to-1 in the atmosphere. It's practically maintenance-free—needs no paint.

ARMCO ZINCGRIP® STEEL assures customers of complete zinc protection in drawn or formed products because its tightly adherent coating holds fast despite severe fabrication. Equally-workable Armco ZINCGRIP PAINTGRIP® gives your products this same zinc protection, plus a special mill-applied phosphate film that takes paint immediately and holds it longer.

ARMCO ENAMELING IRON is a specially processed base metal for porcelain enamel finishes that sell. It's tops in uniformity. Its high purity keeps enameling defects at a minimum. It won't sag at firing temperatures. It's made *only* for porcelain enameling.

ARMCO WELDED STEEL TUBING can give tubular products great strength, as well as the protection of durable coatings of zinc and aluminum.

SPECIAL ARMCO SERVICES

Armco sales engineers and technical specialists will be glad to work with you in selecting the Armco Special Steels that will give your products the quality advantages you want. They will also be happy to consult with your designers. And perhaps they can suggest fabrication methods that will help speed production and keep costs low.

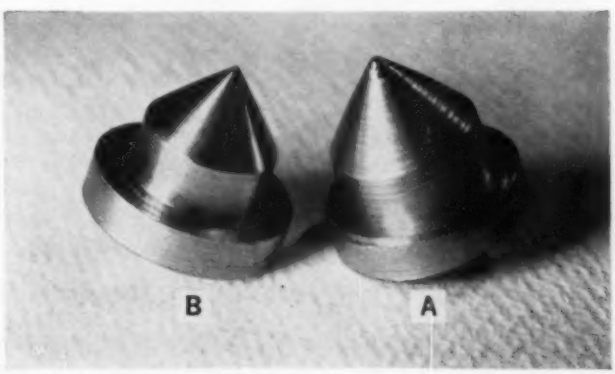
But Armco doesn't stop with technical information. Our marketing specialists stand ready to bolster your product promotion with special aids for sales and marketing.

Why not learn *more* about these special Armco services. Just write us at the address below, or call your Armco Sales Office.

Other Armco Steels for top-quality products include Cold-Rolled PAINTGRIP, High Strength Steels, Electrical Steels, Long Ternes, and high-quality Hot- and Cold-Rolled Steels.

HOW A STUDY BY AN ARMCO STAINLESS MACHINING SPECIALIST PAID OFF—IN IMPROVED FINISH, FASTER PRODUCTION

Drawing (left) shows the simple changes in set-up recommended to a manufacturer of stainless steel needle valve points by an Armco Stainless Machining Specialist. The photo (right) shows the big difference they made. The original valve point (A) had poor finish—no good at all for a leak-proof valve seat. The present product (B) has an excellent finish. What's more, machining time is less.



ARMCO STEEL

ARMCO STEEL CORPORATION
1968 Curtis Street, Middletown, Ohio

SHEFFIELD DIVISION • ARMCO DRAINAGE & METAL PRODUCTS, INC.
THE ARMCO INTERNATIONAL CORPORATION

ARMCO STEEL CORPORATION
1968 Curtis Street
Middletown, Ohio

Send more information about these Special Armco Steels:

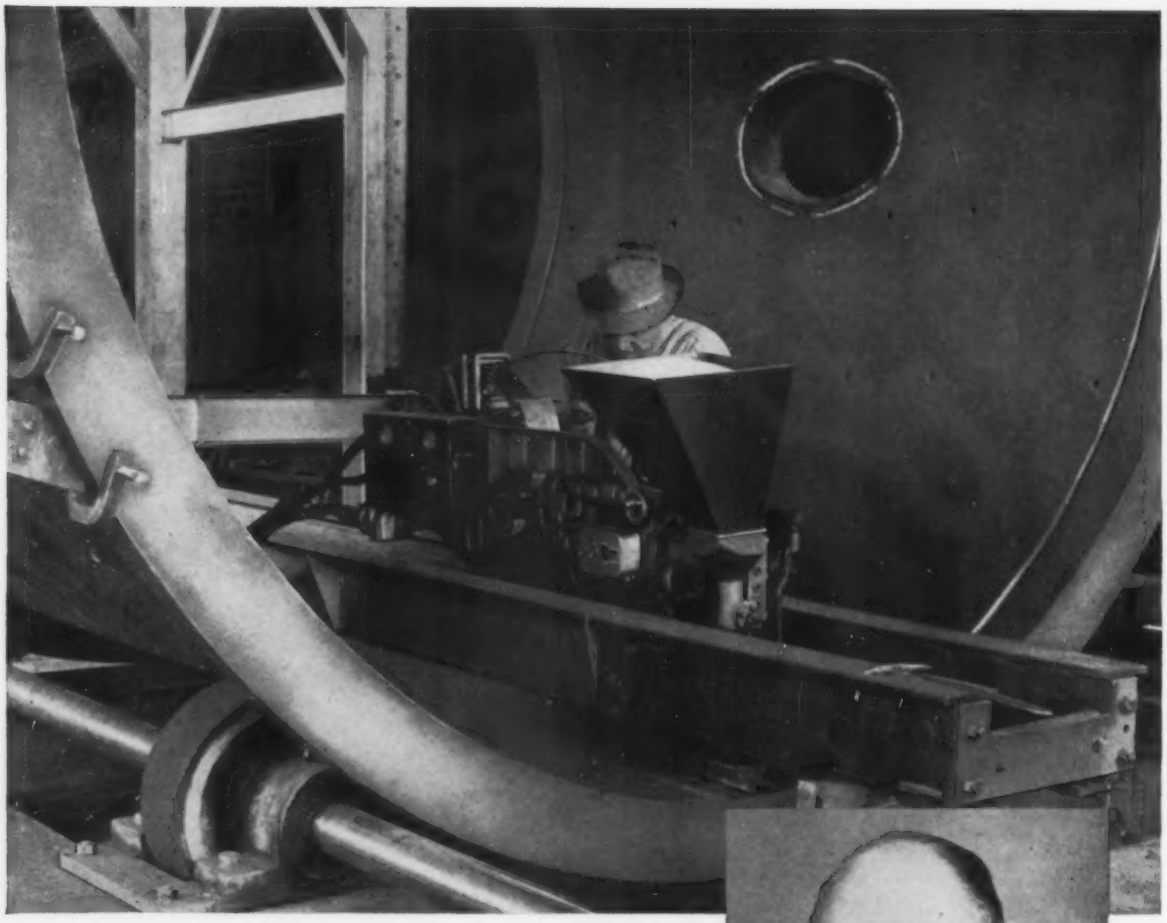
☐ Stainless ALUMINIZED STEEL ☐ Type 1 ☐ Type 2
☐ ZINCGRIP ☐ ZINCGRIP PAINTGRIP ☐ Enameling Iron
☐ Welded Steel Tubing

NAME _____ TITLE _____

FIRM _____

STREET _____

CITY _____ ZONE _____ STATE _____



Many of Mine and Smelter's Marcy grinding mills are equipped with Standard Steel flange rings, shown above. No flange ring replacements have ever been required. Some of these mills have been operating 24 hours a day for more than 15 years.

"'Dependability' is the keyword in our very fine relationship with Standard Steel"

We at Standard are happy indeed that Mine & Smelter Supply Co.'s chief engineer, J. R. Grout, appreciates the efforts we have gone to over the years to combine dependable service with our know-how and quality standards.

We consider it our responsibility to help maintain the world-wide reputation for quality mining and industrial equipment which Mine & Smelter Co.'s Marcy Mill Division enjoys by providing this customer with the same fine service it renders, in turn, to *its* customers.

Won't you discuss your needs for weldless rings, flanges, forgings and castings with us. You will appreciate our personalized service. Write Dept. 1-D.

"Standard Steel for many years has been supplying our company with shell flange rings, as well as riding and roller tires for use on our Marcy Grinding Mills and other rotary-type equipment. Their product quality and cooperation have helped make it possible for us to serve our customers promptly—our company policy. I believe the word 'dependability' is the keyword in our very fine relationship with Standard Steel," says Joseph R. Grout, chief engineer, Marcy Mill Division, Mine & Smelter Supply Co.

Standard Steel Works Division

BALDWIN · LIMA · HAMILTON

BURNHAM, PENNSYLVANIA

Rings • Shafts • Car wheels • Gear blanks • Flanges • Special shapes

this is the only passport you need to shop the markets of the entire world

2nd Annual

U. S. WORLD TRADE FAIR

MAY 7-17, 1958 • NEW YORK COLISEUM

Take the guesswork out of your industrial purchasing problems!

Get all the data, all the facts at the 2nd Annual U. S. World Trade Fair. Here, under one roof, see, investigate, and compare the latest in foreign methods and materials, *exhibited for the very first time in the United States*. These are the new advances in products and services, design engineering and technical know-how from Europe, the Middle East, Asia, Canada, South and Central America.

MACHINE TOOLS • PRECISION TOOLS • POWER EQUIPMENT • ELECTRONIC EQUIPMENT • SCIENTIFIC INSTRUMENTS • BUILDING MATERIALS AND SUPPLIES • BASIC MATERIALS • ELECTRICAL EQUIPMENT AND MOTORS • OFFICE EQUIPMENT • BUSINESS MACHINES • TYPEWRITERS • PRINTING MATERIALS . . . *and a host of other items!*

Discuss your particular business problems with the qualified representatives of leading foreign manufacturers. If it's a new product under the industrial sun, it's spotlighted, to save you time and money, at this year's Fair.

Send today for your "passport" to the "greatest marketplace in the Western Hemisphere"

No red tape, no vaccinations, no charge! Just present this registration card at the portals of New York City's Coliseum and the doors open wide to you on the products and services of the wide, wide world. (Mail coupon below for your registration card)

The First Annual U. S. World Trade Fair held in April 1957 at the Coliseum was an outstanding success . . . attracting 127,780 buyers and over 700,000 visitors from all parts of the world. 3,000 exhibitors from 60 countries displayed their wares. It was the largest and most successful International Trade Fair ever held in the United States. The number of exhibitors for this year's Fair already surpasses last year's figure—guaranteeing that the 1958 Fair will be even bigger and better.

REGISTRATION COUPON FOR THE TRADE ONLY

Save time by registering NOW. Fill in and mail this registration coupon to the address below and your admission credentials will be mailed to you. There is no registration fee.
Please check below if you wish us to make hotel reservations for you.

PLEASE PRINT

NAME_____ TITLE_____

FIRM_____

STREET_____

CITY_____ STATE_____

TYPE OF BUSINESS_____

PRODUCTS MFG'D OR SOLD_____

Please check below the classification of your business

- ☐ Wholesaler
- ☐ Importer
- ☐ Retailer
- ☐ Exporter
- ☐ Mfrs.' Agent
- ☐ Manufacturer
- ☐ Dept. and Chain Store Buyer
- ☐ Other

☐ Please send us your hotel reservation blank.

UNITED STATES WORLD TRADE FAIR, 331 Madison Ave., New York 17, N. Y.

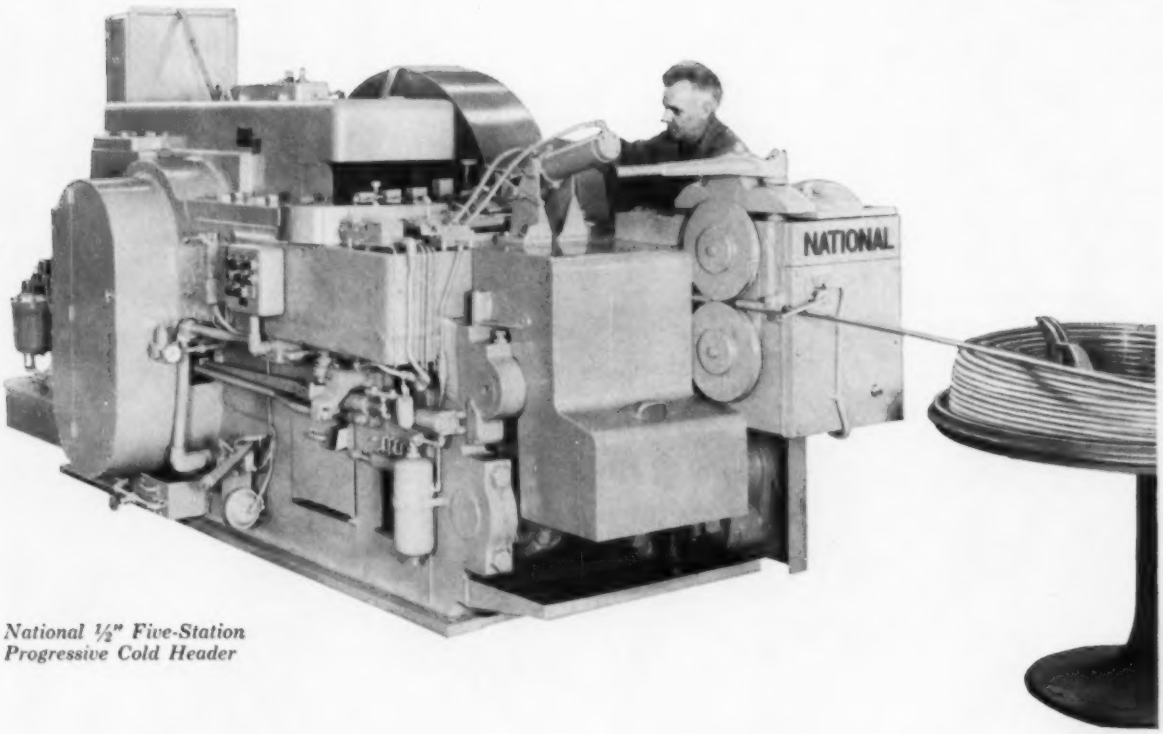
Top row, left to right: piston pin, wheel nut, ball stud, pump shaft, faucet stem.
Middle row: spark plug body, eye bolt, shuttle tip, ball socket, universal joint bearing cup, splined square-head shaft.
Bottom row: tube nut, tappet plunger, hollow rivet, blind rivet, distributor cap insert, commutator bar.

These are typical parts you can make to advantage, not by wasteful cutting, but by *cold heading* — flowing metal into accurate shapes. All of the above jobs, with one exception, were made complete from coiled wire to finished part, without intermediate annealing and coating, *in one compact machine!*

Why are formerly difficult-to-head jobs like these not only possible now, but commercial? The answer is teamwork, on many fronts. For example:

(1) More versatile metals are now available in coiled wire. (2) Die materials and lubricants are still better. (3) We are getting important (to us) but usually insignificant concessions from cold-heading-minded parts designers. (4) National Cold Headers, multiple-die Progressive Headers, Cold Formers

The modern way to make Metal Parts faster, stronger, to amazingly close dimensions!



National ½" Five-Station Progressive Cold Header

and Boltmakers, backed by our fast-growing engineering experience, are now specially equipped to produce reliably the formerly difficult jobs like these shown here.

Are your production problems like these? Perhaps cold heading could pay off for you in a remarkably short time. Let's find out.

Here is our service to metalworking, and you are under no obligation to buy. Send us samples or prints of your jobs. Better yet, bring them to Tiffin where more of our experienced people can participate in *your* problem.

We shall be happy to work with you in developing that better method.

Founded 1874—DESIGNERS and BUILDERS of MODERN FORGING MACHINES • MAXIPRESSES • REDUCEROLLS • COLD HEADERS BOLTMAKERS • NUT FORMERS • TAPPERS • NAILMAKERS CO-PIONEERS WITH INDUSTRY OF ADVANCED METALWORKING PRODUCTION METHODS

NATIONAL MACHINERY CO.

TIFFIN, OHIO, U. S. A.

HARTFORD DETROIT CHICAGO

Fastener Facts

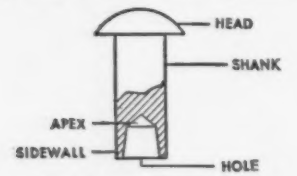
by Paul Tunison, Chief Engineer — Judson L. Thomson Mfg. Co.

DESIGN PRODUCTION & PURCHASING DATA

FASTENING WITH SEMI-TUBULAR RIVETS

WHY RIVETS?

You specify rivets when you want strong, permanent fastening at low cost. However, secure fastening is not their only function. You can also use them as fulcrums, pivots, cam followers, electrical contacts, studs, stops and in many other applications.



Typical semi-tubular rivet

WHY SEMI-TUBULAR RIVETS?

You specify semi-tubular rivets when you want to combine the high shear and compression strength of solid rivets with low-cost, high-speed fastening. The required strength is inherent in the design of Thomson Semi-Tubular Rivets.

Shallow holes in solid shanks distinguish semi-tubular rivets from other types. The hole is seldom deeper than shank diameter. Its depth is determined by clinch requirements of specific applications. A general rule is to select a rivet with length equal to the thickness of the materials *plus* 55% of the diameter of the shank. A Thomson engineer can quickly specify the correct rivet length and hole depth for any particular semi-tubular riveting application.

Semi-tubular rivet applications call for pre-drilled or punched holes in the materials to be fastened: metals, plastics, wood, ceramics and other hard materials. The size of the prepared holes is an important design consideration. When holes are too small, rivets choke. When too large, rivets buckle. To avoid either error, make sure that each hole is about 7% larger than the maximum shank diameter of the rivet. In most cases, the setting process causes shank expansion sufficient to fill the hole. Again, Thomson engineering is at your service to help you match rivet and hole sizes.

High shear strength of semi-tubular rivets is further assured by Thomson production methods. All Thomson Semi-Tubular Rivets are made from specially prepared wire by the cold heading or upsetting process. This results in fasteners with the uniform structure and *inherent strength of forgings* . . . properties not achieved by screw-machine rivet production.

Standard materials used to produce Thomson Semi-Tubular Rivets include aluminum, brass, copper, nickel-silver, low-carbon steel and stainless steel. For special electrical and electronic contacts, coin silver, fine silver, palladium and other precious metals may be specified.

Finishing to specifications is another service of interest to design engineers. Rivets can be plated with brass, cadmium, copper, nickel, tin, zinc, etc. Morever, they can be oxidized or finished in japanned colors to match the original equipment or product.

Low fastening costs result from the application of Thomson Semi-Tubular Rivets with automatic rivet-setting machines. The low cost of rivets, as compared with most other fasteners, combined with high machine speeds invariably leads to production line economies. Machines are low in initial cost and require little maintenance. Furthermore, they can be operated by unskilled labor.

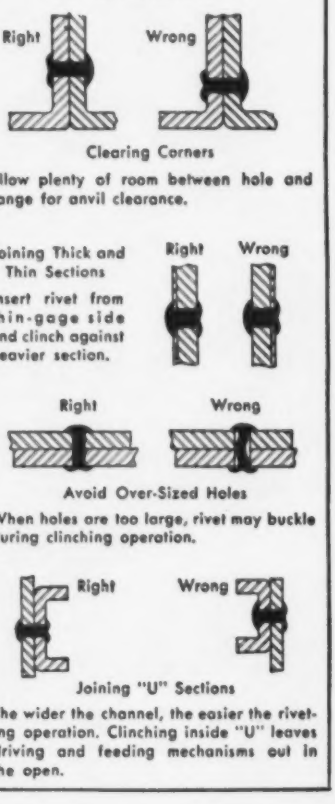
FLOOR-TYPE FOOT-OPERATED | FLOOR-TYPE MOTOR-OPERATED

HIGH PRODUCTION RIVET-SETTING MACHINES

Thomson has developed more than 200 styles of modern, high speed machines which can be adapted to innumerable fastening jobs. These machines are divided into three basic models: floor type with foot-pedal operation, floor type with motor operation, and bench type with motor operation. All permit automatic hopper feed for maximum speed, and some motor driven floor models are equipped for multiple rivet-setting.

Special work-handling devices accelerate riveting operations. Radial or turret feeds are common accessories for machines geared to high-production fastening of parts, as are all types of special loading fixtures. Thomson selects the proper machine to do your job most efficiently and custom-tools it to fit your fastening requirements.

DESIGN PRACTICES


Right
Wrong
Clearing Corners
Allow plenty of room between hole and flange for anvil clearance.
Joining Thick and Thin Sections
Right
Wrong
Insert rivet from thin-gage side and clinch against heavier section.
Right
Wrong
Avoid Over-Sized Holes
When holes are too large, rivet may buckle during clinching operation.
Right
Wrong
Joining "U" Sections
The wider the channel, the easier the riveting operation. Clinching inside "U" leaves driving and feeding mechanisms out in the open.

DESIGN & ENGINEERING SERVICE

We will gladly evaluate your fastening problems at little or no cost. Contact us while designs can still be modified for lowest cost fastening method. Simply send sketches, prints, or preferably samples of actual work.

FREE "FASTENER FACT FILE"

Be one of the first to profit from our new manual on all phases of riveting. It covers rivet types, applications, materials, finishes, and other factors that determine selection of the right design, rivet and machine for cutting fastening costs. Request your copy today. Write Judson L. Thomson Mfg. Co., Dept. I, Waltham 54, Massachusetts.

JTL JUDSON L. THOMSON MFG. CO., WALTHAM 54, MASS.

See us at Booth 308 at the Design Show

One of Claymont's multi-torch automatic flame-cutters.

by d'Arazien

Main feature of the Claymont story is integration. For instance, consider one phase of our operation—the new Fabrication Shop. First, steel from Claymont's own open hearth is formed into plate on Claymont's own rolling mills and sent to the Fabrication Shop. Here, modern equipment welds, shears, presses, rolls, cuts or machines the plate to produce fabricated products for many industries.

CLAYMONT
FABRICATED STEEL PRODUCTS

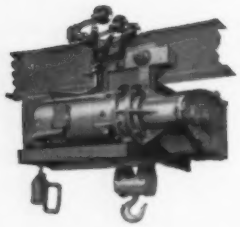
CF&I

CHECK CLAYMONT FOR—Alloy Steel Plates · Carbon Steel Plates · Stainless-Clad Steel Plates · High Strength Low Alloy Steel Plates · CF&I Lectro-Clad Nickel Plated Steel Plates · Pressed and Spun Steel Heads · Manhole Fittings and Covers · Fabricated Steel Products · Large Diameter Welded Steel Pipe

PRODUCTS OF WICKWIRE SPENCER STEEL DIVISION · THE COLORADO FUEL AND IRON CORPORATION

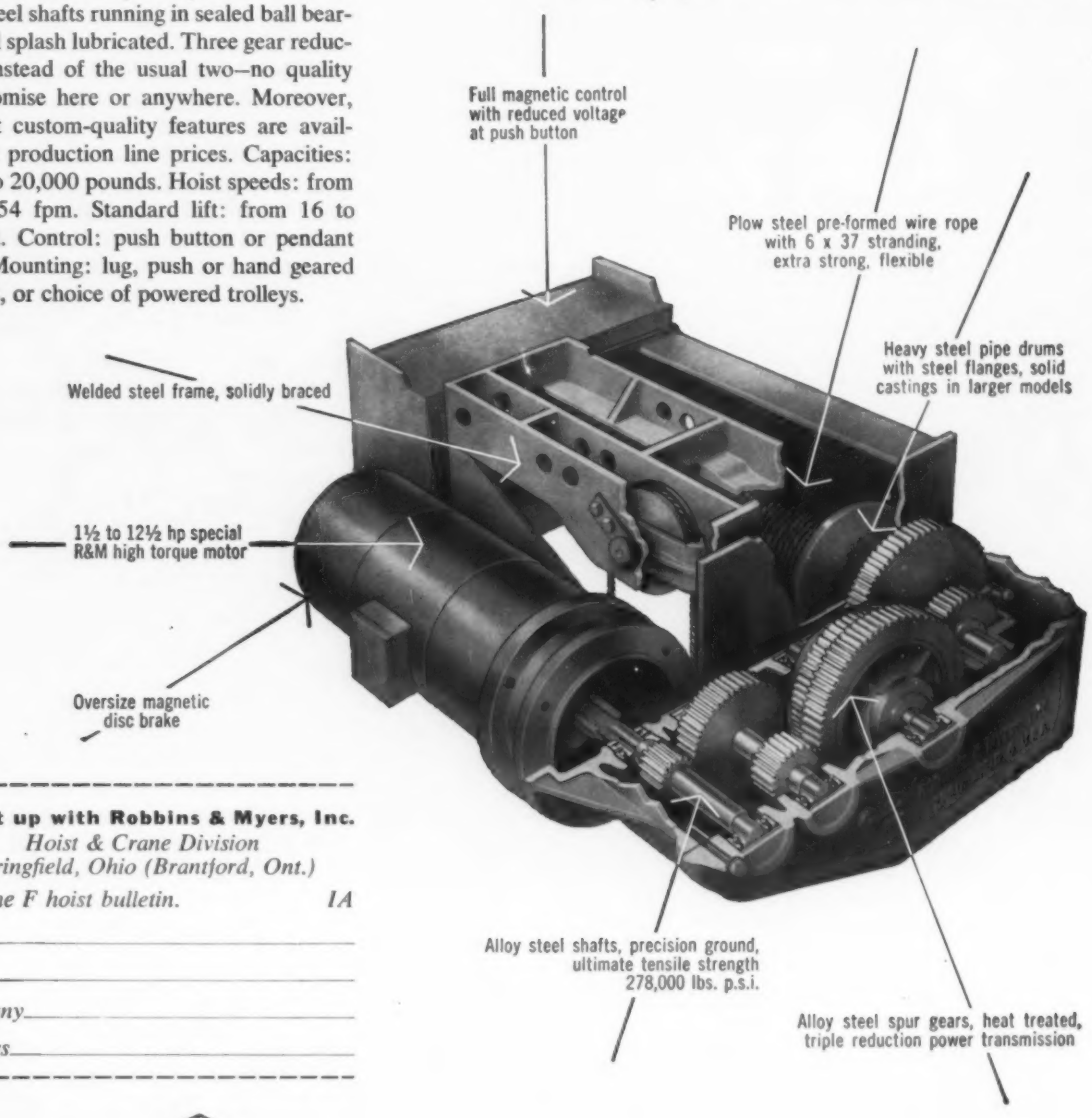
Plant at Claymont, Delaware · Sales Offices in all Key Cities

5787



choose a hoist with extra stamina

R&M F hoists cut down the cost of lifting but the F hoists save still more money. Dollars usually spent on maintenance become dollars earned because of the extra stamina built into each component. Look at the gearing—here are precision cut alloy steel spur gears, wide faced and heat treated for durability. They're mounted on alloy steel shafts running in sealed ball bearings, all splash lubricated. Three gear reductions instead of the usual two—no quality compromise here or anywhere. Moreover, F hoist custom-quality features are available at production line prices. Capacities: 1000 to 20,000 pounds. Hoist speeds: from 10 to 54 fpm. Standard lift: from 16 to 40 feet. Control: push button or pendant rope. Mounting: lug, push or hand geared trolleys, or choice of powered trolleys.


Full magnetic control with reduced voltage at push button
Plow steel pre-formed wire rope with 6 x 37 stranding, extra strong, flexible
Heavy steel pipe drums with steel flanges, solid castings in larger models
Welded steel frame, solidly braced
1½ to 12½ hp special R&M high torque motor
Oversize magnetic disc brake
Alloy steel shafts, precision ground, ultimate tensile strength 278,000 lbs. p.s.i.
Alloy steel spur gears, heat treated, triple reduction power transmission

take it up with Robbins & Myers, Inc.
Hoist & Crane Division
Springfield, Ohio (Brantford, Ont.)

Send me F hoist bulletin. *IA*

*Name*_____

*Title*_____

*Company*_____

*Address*_____

ROBBINS & MYERS **hoists • cranes • winches**

Atlas missile test tower

MISSILE LAUNCHING VALVE COST REDUCED 30% WITH ESCO CASTING

Problem: Fabricating high pressure gas tank butterfly valve bodies for missile component manufacturer Convair-Astronautics, San Diego, California, proved unsatisfactory. Consisting of wrought stainless steel flanges and tubes welded together and machined, valve costs were high. Weld seams were susceptible to intergranular corrosion and gas leakage. This was a critical installation as these units had to withstand test temperatures ranging from −65° to 500° F., at 2,000 vibrations per second and at stresses up to 15 gravity units.

Solution: The valve body was redesigned as a casting. One-piece design alloy steel improved strength and corrosion resistance and practically eliminated the danger of gas leakage. *ESCO* centrifugal casting technique permitted casting six 180-pound valve bodies simultaneously. Resulting savings in material and labor amounted to 30 per cent of previous costs.

You can simplify your design problems by calling an ESCO engineer today.

ESCO®

ELECTRIC STEEL FOUNDRY COMPANY

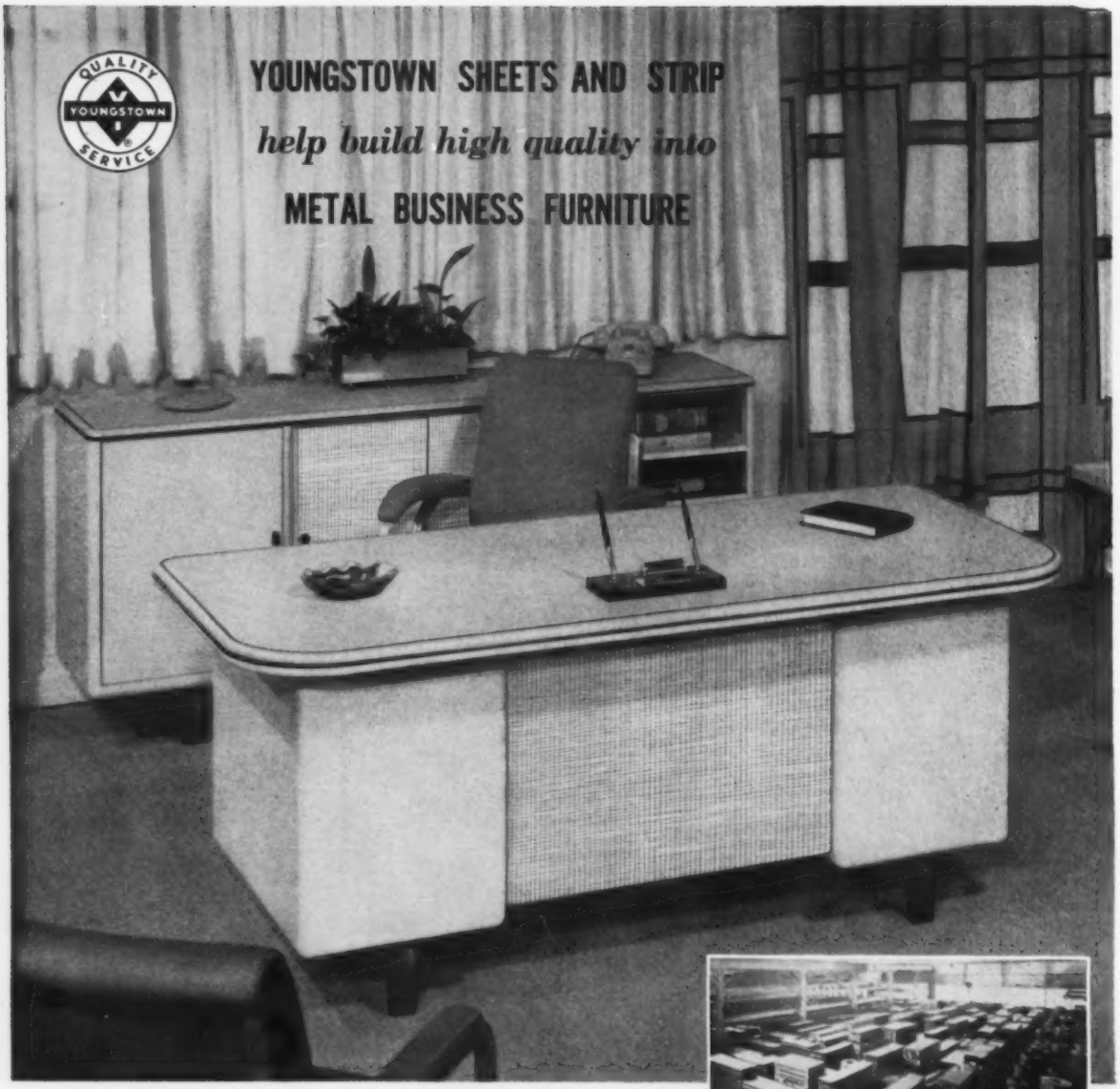
2184 N. W. 25TH AVE. • PORTLAND 10, OREGON

MFG. PLANTS AT PORTLAND, ORE. AND DANVILLE, ILL.

Offices in Most Principal Cities

ESCO INTERNATIONAL, NEW YORK, N. Y.

IN CANADA ESCO LIMITED



COLD ROLLED SHEETS AND STRIP

Photos courtesy The General Fireproofing Co.

Modern executives look for high quality in their metal office furniture . . . quality both in appearance and usefulness. To help meet this demand, YOUNGSTOWN supplies quality-controlled steel sheets and strip as basic raw material to the nation's leading fabricators.

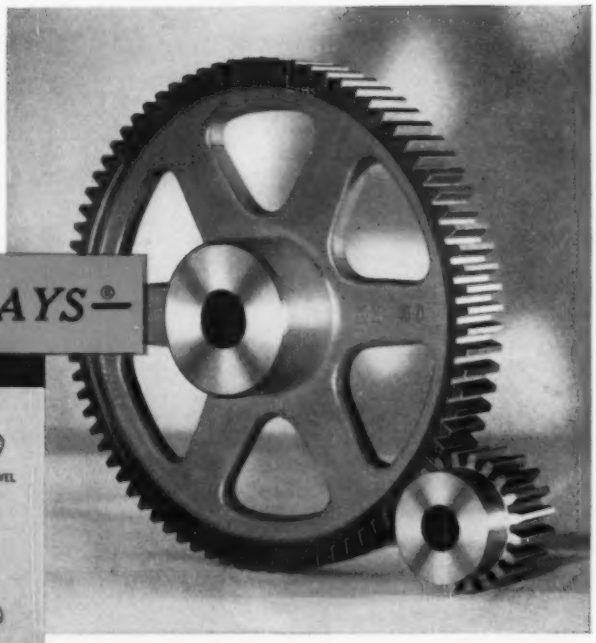
YOUNGSTOWN'S 56 years of steelmaking knowhow provides sheets and strip with the right combination of tensile strength, surface finish and ductility. This high quality YOUNGSTOWN steel assures top-production runs of even the most difficult-to-form parts.

Our many satisfied customers report these facts about YOUNGSTOWN sheets and strip:
Increased Production - Fewer Rejects - Accurate, Fast Forming - Reduced Fabrication and Die Costs
make YOUNGSTOWN SHEET & TUBE steel your continuing specification for lower production costs and improved product quality. Our nearest District Sales Office will be happy to supply any additional information or metallurgical assistance. Call YOUNGSTOWN today!

THE YOUNGSTOWN SHEET AND TUBE COMPANY
Manufacturers of Carbon, Alloy and Yoloy Steel
General Offices - Youngstown 1, Ohio
District Sales Offices in Principal Cities

Plan for extra savings when you design power transmission drives . . . remember

—STANDARDIZATION PAYS®—



7124
STANDARDIZED TRANSMISSION PRODUCTS
— OFF-THE-SHELF
— AT FACTORY PRICES

Get CATALOG No. 56 for complete listings. Includes 50 pages of engineering data for drive design.

Design around BOSTON Gear®

When you standardize on BOSTON Gear transmission components, you'll be days and *dollars* ahead in drive design.

You simplify planning. Select all the parts you need from one source—the full range of types and sizes listed in the Boston Gear Catalog.

You save time and expense. Order the parts you need from your local Boston Gear Distributor, and get off-the-shelf delivery—from stock—at factory prices.

You get top-rated performance. Compare and see why cost-wise buyers agree that Boston Gear products set the highest quality standards.

Why wait (and pay more) for parts "made-to-order?" Your Boston Gear Distributor is fully qualified to help you get the maximum benefits from standardization—in lower costs, in simplified servicing. Boston Gear Works, 72 Hayward St., Quincy 71, Massachusetts.

Visit BOSTON GEAR Booth No. 554
at the DESIGN ENGINEERING SHOW, Chicago

CALL YOUR BOSTON Gear DISTRIBUTOR

For nearest Distributor LOOK UNDER "GEARS" in the 'Yellow Pages'

Photo courtesy of Jones & Laughlin Steel Corporation

BAKER'S MAGDOLITE AND JEBCOLITE
are always 5 ways better

Continued research and development throughout the years, plus The J. E. Baker Company's precisely controlled manufacturing methods, have resulted in the superior, properly burned, grain-sized Magdolite and Jebcolite particles which help provide:

More uniform ingots—increased ingot production—increased furnace efficiency—lower refractory costs—less defective production material.

Magdolite and Jebcolite* are the *original* dead-burned dolomites that offer better composition, preparation, strength, economy and quality. Don't say "dolomite." Save dollars. Specify Baker's Magdolite for open hearth and Jebcolite for electric furnace use.

** Jebcolite has the same superior chemical, physical and mineralogical characteristics as Magdolite and differs only in grain size which is designed specifically for electric furnace application.*

JEBCO
PRODUCTS
SINCE 1889

THE J. E. BAKER COMPANY
YORK, PENNSYLVANIA
PLANTS: BILLMEYER, YORK, PENNSYLVANIA — MILLERSVILLE, OHIO

arpenter

Welded Stainless Pipe
available from large
local stocks . . . real cost savings
at a time when costs are
hard to cut . . .

• Carpenter Welded Stainless Pipe saves you money on initial cost, but that's only the beginning. Because it's consistently more uniform, Carpenter Stainless Pipe provides service benefits that increase effective corrosion resistance and give longer life. Schedule 5, 10 and 40 stainless pipe is stocked by your nearby Carpenter distributor in quantities that assure you immediate delivery. The Carpenter Steel Company, Alloy Tube Division, Union, N. J.

Carpenter

Stainless Pipe

Interstate Drop Forge Company—

20 Years a Cities Service Customer and Still Forging Ahead!

The modern way to cut a die is typified by die sinking machine, one of many at Interstate Drop Forge Company. All die sinking machines are lubricated by Cities Service lubricants.

With production running at roughly 1000 tons per month, Interstate Drop Forge Company of Milwaukee is one of the largest forging concerns in the Wisconsin area and growing all the time.

An integral part of this growth story, Cities Service is proud to have filled Interstate's lubrication needs for the past 20 years.

Drop hammers... helve hammers... upsetters . . . forging rolls . . . shapers . . . automatic metal saws. These are but a few of the diversified machines lubricated by specially tailored Cities Service oils and greases.

Actually, in a plant of this type with so many differing pieces of machinery, it would be possible to have as many as 25 different lubricants. But, Interstate, with the aid of their Cities Service Lubrication Engineer has been able to standardize on twelve Cities Service lubricants.

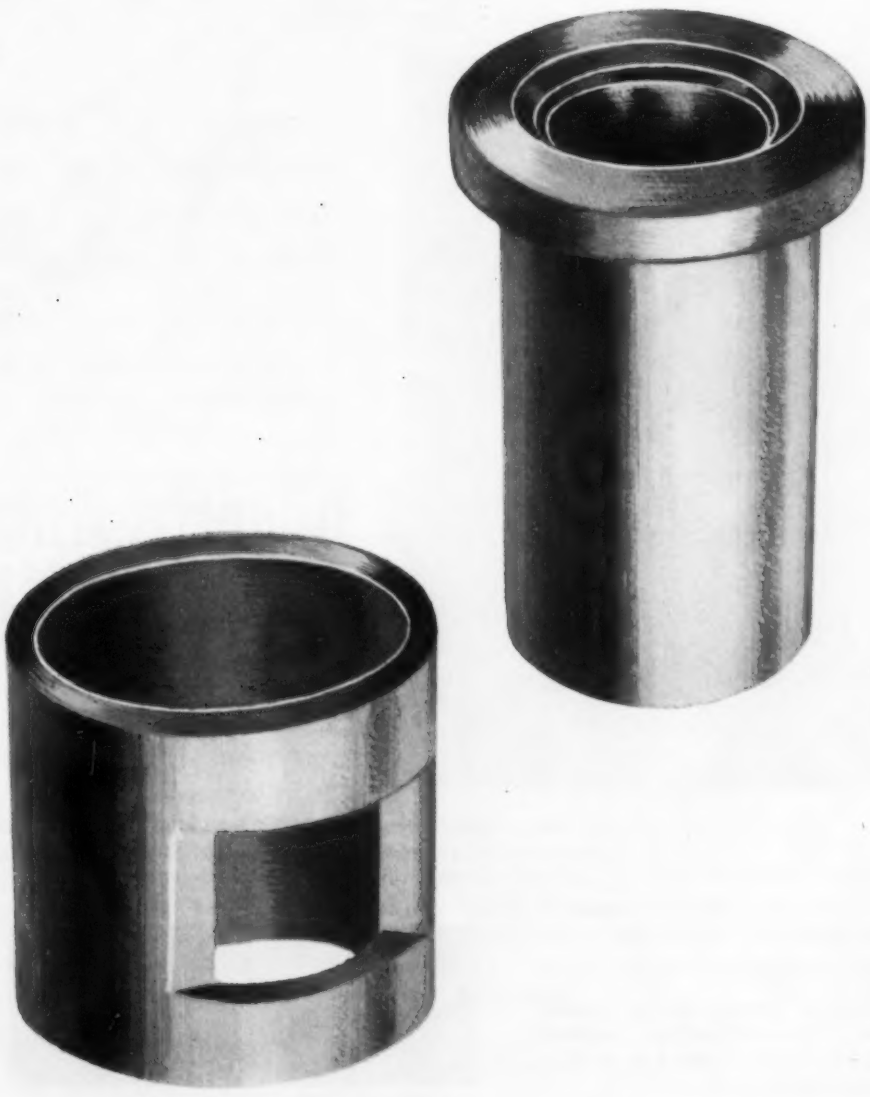
Streamlining . . . standardizing . . . improving. These are some of the services a Cities Service Lubrication Engineer can render for your operation, too. Ask him to make a free lubrication survey of your plant. Call the nearest Cities Service office or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

5 Positive ways Asarcon® continuous-cast bearing bronze saves you money: 1) Exact lengths. Order Asarcon 773 (SAE 660) in exact lengths you need, up to 105″. No short-end scrap as from ordinary cast bars. 2) Close-to-size. Asarcon 773 gives you only 1/32″ to 3/32″ to machine off, in diameters from 1/2″ to 9″. 3) Less machining. Less stock to remove saves machining time and cost. 4) No blow-holes, pits, or shrinks. No sand to dull tools. No hard or soft spots. No loss of machining time or parts thrown away because of metal defects. 5) Less down-time. The better, more uniform properties of Asarcon 773 assure longer life of important machine parts, and fewer breakdowns. Asarcon 773 bearing bronze is carried in 260 stock sizes, solids and tubes. See your local distributor or write Continuous-Cast Products Department, American Smelting and Refining Company, Barber, N. J. West Coast Sales Agent: Kingwell Bros., Ltd., 457 Minna St., San Francisco. In Canada: Federated Metals Canada, Ltd., Montreal and Toronto.

CONTINUOUS-CAST DEPARTMENT OF



ASARCO

AMERICAN SMELTING AND REFINING COMPANY

Protection from Metal Splashes

Here it is...

AO's New 315 Chipper's Goggle

(Also available in Dust goggle as No. 316 with 150 mesh inner screen set behind a 16 mesh screen)

Engineered Vision and Protection at their best for Chippers, Foundrymen and Others!

This goggle is recommended for protection against impact hazards such as chipping, melting, pouring, grinding, babbitting, riveting, hand tool and machine work. Goggle is regularly supplied with soft *plastic* mask — with leather available. Edges of sponge rubber are bound with corduroy. Super Armorplate clear or Calobar lenses in medium, dark or extra dark shades.

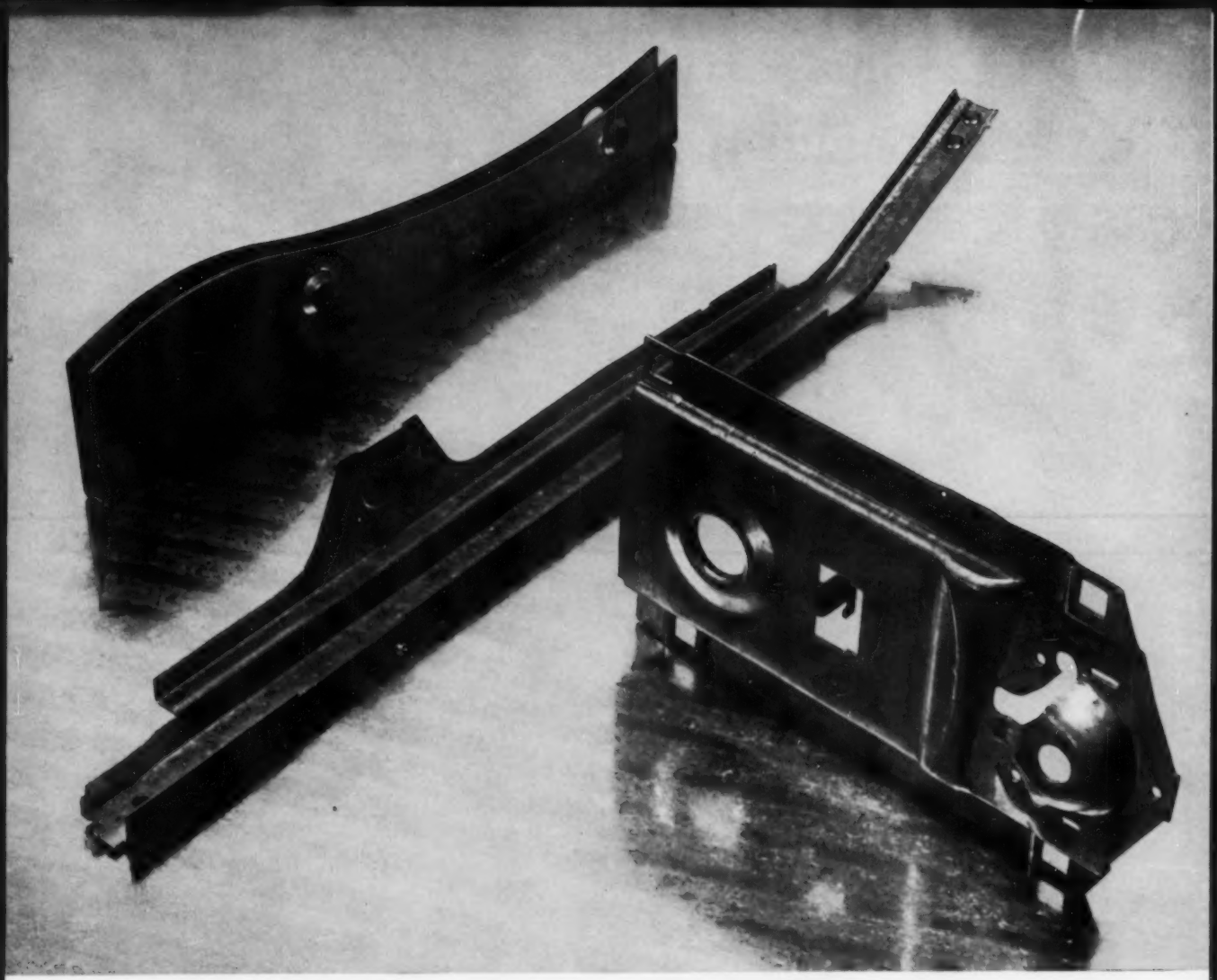
FEATURES...

1. Greater Protection — larger face mask
2. Better Vision — 57.8 mm. wide vision lenses instead of the former 50 mm. round lenses
3. Increased (double) Ventilation — 40 mesh screen
4. Perfect Fit — Over all types of spectacle glasses. One-piece, easily adjustable rubber headband "clips" through metal frame instead of mask — assures maintained closer fitting
5. Standard screw endpieces

Quality costs no more! Always insist on the AO Trademark. Your nearest American Optical Safety Products Representative can supply you.

American Optical
COMPANY
SAFETY PRODUCTS DIVISION

SOUTHBRIDGE, MASSACHUSETTS
Branches in Principal Cities



WHEN WEIRKOTE® GOES ON THE JOB, PLATING OPERATIONS CAN GO OUT THE WINDOW.

THE PROBLEM: The close channel walls and variable stages of these steel frame parts defied economical, uniform, flawless plating.

THE SOLUTION: The manufacturer switched to Weirkote zinc-coated steel sheets. Result—uniform anti-corrosion protection for his parts, which means that the manufacturer may eliminate post-fabrication plating. Weirkote's continuous-process integrates the zinc and the steel. Even though you work Weirkote to the limit of the steel itself, it just won't flake or peel. It gives first-class protection against corrosion, eliminating inventory losses which might occur in the factory. And it gives first-class protection when out doing its work for your product.

And now, Weirkote is treated to inhibit wet storage (white oxide) stain.

Look into Weirkote zinc-coated steel sheets and the many cost savings and product advantages it can lay on your doorstep. Write for free brochure today. Weirton Steel Company, Dept. A-11, Weirton, West Virginia.

WEIRTON STEEL COMPANY

WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

a division of

NATIONAL STEEL CORPORATION

A LITTLE GOES A LONG WAY! Don't overlook vanadium! Though vanadium has been an alloy "staple" for years, it's still one of the most useful and important alloying elements. No other alloy is as versatile as vanadium. And because vanadium is so *effective*, just a *little* does a big job. What's more, vanadium is plentiful and economical — actually costs no more than it did thirty years ago!

Why not discover — or reappraise — vanadium as it applies to your operations in tool and other alloy steels, large forgings, deep drawing steels, and iron and steel castings.

Versatile vanadium is also used in aluminum-base and titanium-base alloys, in glass, ceramics, inks, coloring agents, and in catalysts for synthetic textiles and petroleum refining. Your nearest VCA Office can tell you more about the advantages and economies of Vancoram Vanadium Products. Call today! Vanadium Corporation of America, 420 Lexington Avenue, New York 17, New York.

BE SURE TO SEE US AT THE AIME OPEN HEARTH MEETING — Hotel Statler-Hilton, Cleveland, Ohio — April 14-16!

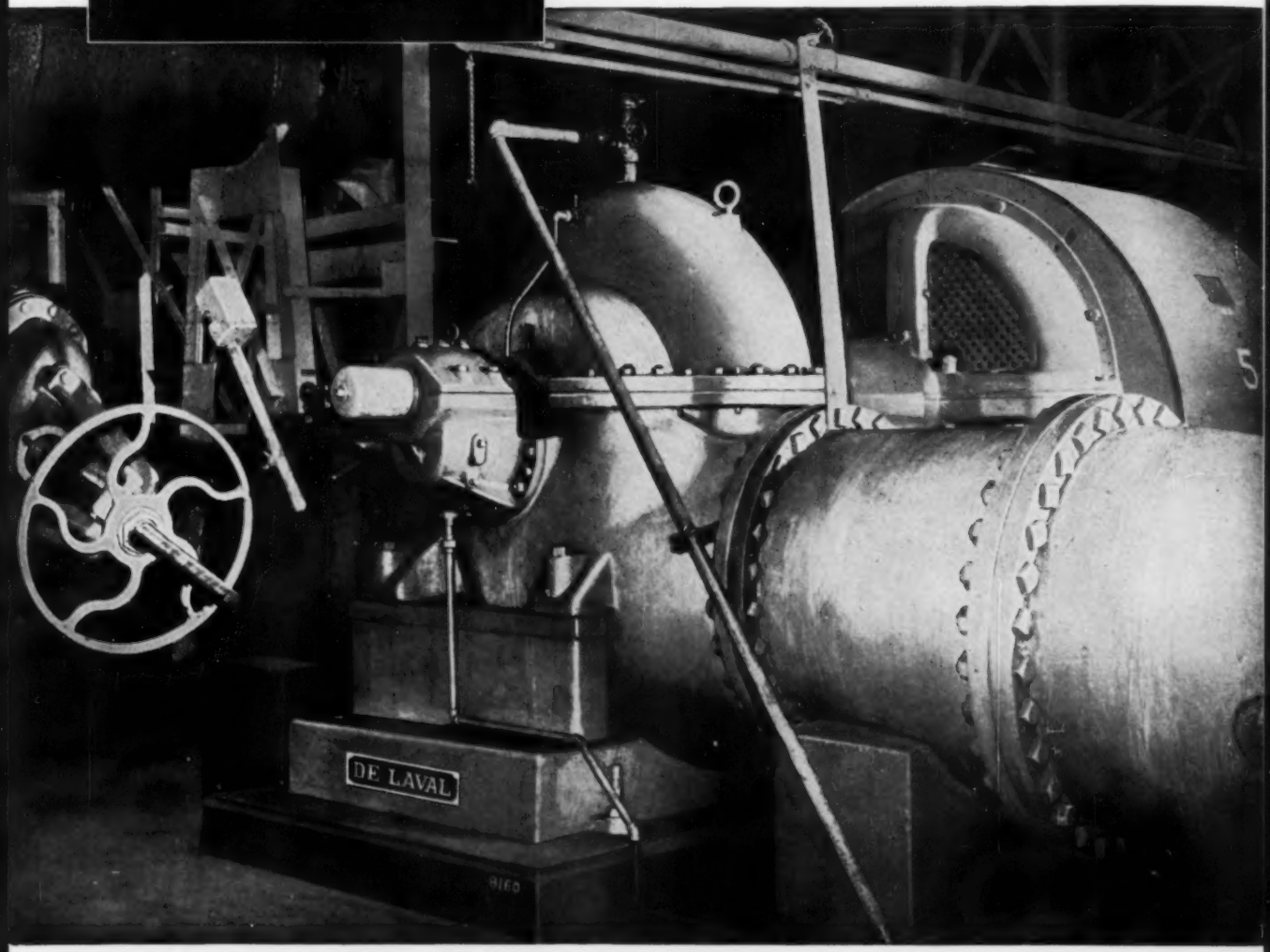
Producers of alloys, metals and chemicals

VANCORAM

VANADIUM CORPORATION OF AMERICA

DE LAVAL
CENTRIFUGAL
PUMPS

in service since 1911 at Inland Steel Co.



De Laval Centrifugal Pumps have a record of dependability at the Inland Steel Co., which goes back forty-five years. In that time, De Laval has supplied this major producer with pumps for practically every steel mill service—*more than 75 units in all.* The photograph shows one of the largest De Laval pumps on the line at the East Chicago, Indiana plant of Inland Steel. The unit delivers 20,000 gpm at 120 ft head.

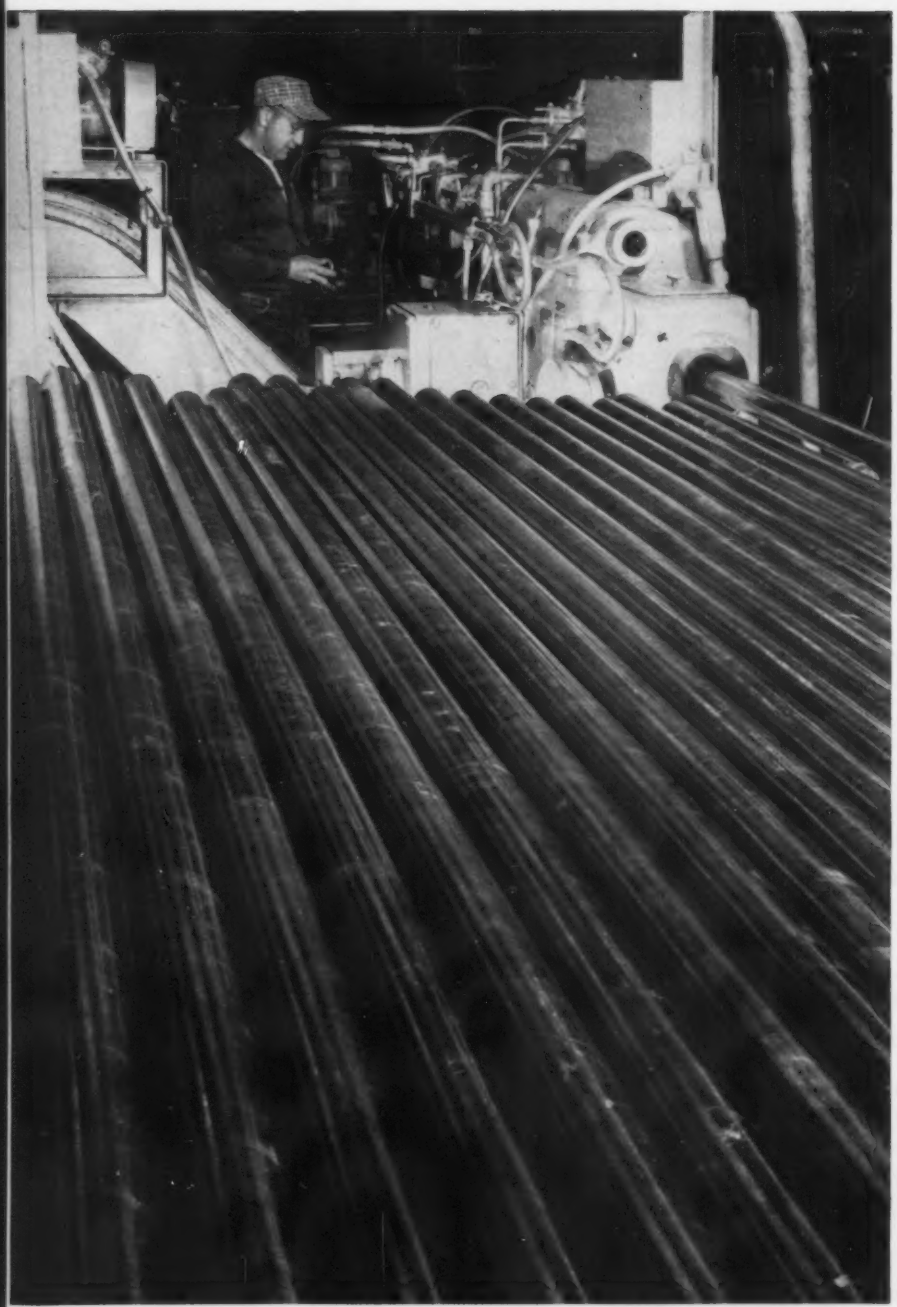
De Laval Centrifugal Pumps are available for a wide range of applications in all types of metal-working plants. Types L, M and P single stage double suction pumps can handle capacities from 1,000 to 20,000 gpm and heads to 350 feet. Larger De Laval units of any capacity to meet any requirement for steel mill service are available.

Send for Bulletin 1004 giving performance and application data.

DE LAVAL *Centrifugal Pumps*

DE LAVAL STEAM TURBINE COMPANY
899 Nottingham Way, Trenton 2, New Jersey

Brand New Transmission in 1958 Cars Uses Pittsburgh Steel Tubes For 3 Key Parts



Here's the raw material for a critical part in a brand new automobile transmission for 1958. These seamless mechanical tubes, a product of Pittsburgh Steel Company, will be cut to size on the machine in the background and processed into shafts for grade retarders.

Developing and producing a new transmission for a leading car challenges suppliers as well as the automaker himself.

Pittsburgh Steel Company's seamless mechanical tubes successfully met such a challenge by making good on three critical parts for a new transmission making its debut in 1958 models.

Ability of Pittsburgh Steel's tubes to meet this auto manufacturer's high requirements and rigid testing assures tube users in other fields of high, uniform quality.

Tubes from the mills of Pittsburgh Steel are used for these transmission parts:

1. Convertor Reaction Shaft—This shaft takes the torque (turning force) built up by the torque convertor and transmits that torque to the gears.

The convertor reaction shaft is made of seamless mechanical tubing with an outside diameter of 2.219 inches and an inside diameter of 1.505 inches. It is cut to size, centered, given centerless grinding, heat treated and broached—or sized—to a tolerance of .001 inch. Welding and final processing follow.

2. Grade Retarder Shaft—This part is a new feature in auto transmissions. It gives cars a new driving range which improves control on steep downgrades and on slippery surfaces without shifting gears.

The shaft is made of tubing 2.375 inches outside diameter and 1.531 inches inside diameter.

3. Front Pump Driven Gear—This gear is an essential part of the new transmission's hydraulic control system. It maintains correct oil circulation and pressure within the transmission.

The finished gear, measuring $4\frac{3}{16}$ inches o.d. and approximately $\frac{5}{8}$ inch on the i.d., has 36 gear teeth. The teeth are broached simultaneously on a vertical broacher.

All three parts are made from carbon steel seamless mechanical tubing which is cold drawn and finished to

Convertor reaction shafts, made from Pittsburgh Steel's seamless mechanical tubing, are assembled into transmission cases at this station in an automaker's huge plant. The shaft transmits torque to the gears.

exacting specifications. The automaker who chose Pittsburgh Steel's tubing for three transmission parts carefully spelled out his specs for fine grain structure, machinability and weldability.

Those specifications were met by skilled tube mill men so that finished tubes were uniform—from length to length and from one shipment to another.

A measure of their skill is demonstrated by broaching which gives tubing grain structure a critical test. Rejects from peeling or chipping drop with Pittsburgh tubes.

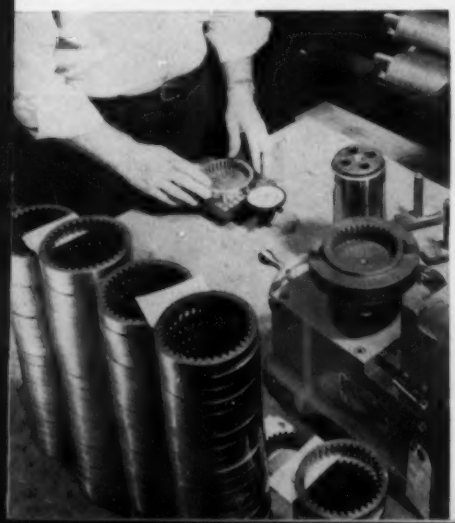
Machinability also is a severe test. In operations where tolerances are held to one-half of one thousandths of an inch, good machinability results in even, smooth production of parts which will pass sharp eyes of inspectors.

Welding operations carried on in automated lines can't be a haphazard operation or one in which quality of welds isn't uniform. Here again Pittsburgh Steel tubes keep production flowing smoothly and produce welds which hold up in field service.

Whether you're making automobile transmissions, hydraulic cylinders, axles or any other product requiring good tubing, you'll profit when you turn to Pittsburgh Steel. Skill of the men in the mill, modern equipment, engineering and metallurgical service available all combine to give you a satisfactory product—one backed by service and dependability.

Act today to get better tubes and service. Telephone or write the nearest district sales office listed below. You'll be glad you did.

Coming off an automated production line, these gears will be assembled into a front pump on a new type of auto transmission.



Pittsburgh Seamless Distributors

Baker Steel & Tube Company
Los Angeles, California

Chicago Tube & Iron Company
Chicago, Illinois

Cleveland Tool & Supply Co.
Cleveland, Ohio

Drummond McCall & Co., Ltd.
Montreal, Quebec, Canada

Edgcomb Steel Company
Philadelphia, Pennsylvania

Gilmore Steel & Supply Co.
San Francisco, California

Earle M. Jorgensen Co.

Perry Kilsby, Inc.
Los Angeles, California

Mapes & Sprowl Steel Co.
Union, New Jersey

Metal Goods Corporation
St. Louis, Missouri

Miller Steel Company, Inc.
Hillside, New Jersey

A. B. Murray Co., Inc.
Elizabeth, New Jersey

C. A. Russell, Inc.
Houston, Texas

Ryerson, Joseph T. & Son, Inc.
Chicago, Illinois

Solar Steel Corporation
Cleveland, Ohio

Steel Sales Corporation
Detroit, Michigan

Tubular Sales
Detroit, Michigan

Ward Steel Service Company
Dayton, Ohio

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

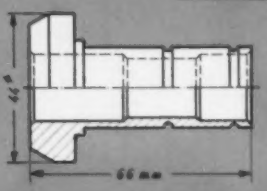
District Sales Offices

Atlanta, Chicago, Cleveland, Dallas, Dayton, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Tulsa, Warren, Ohio

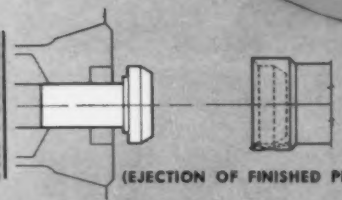
All 'round the world..

HOW ACME-GRIDLEY BASIC DESIGN SAVES TIME IN GERMANY

Automotive sleeve produced in West Germany on a German-built 6 Spindle Acme-Gridley Automatic. Machining is performed in 27.3 seconds, a saving of 30.8% of the time used by previous methods.



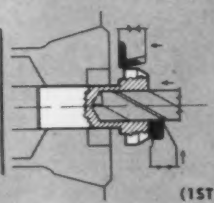
6TH POSITION



(EJECTION OF FINISHED PIECE)

MAGAZINE LOAD (1ST OPERATION)

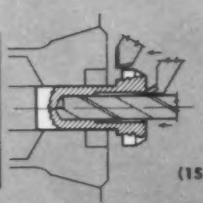
1ST POSITION



(1ST OPERATION)

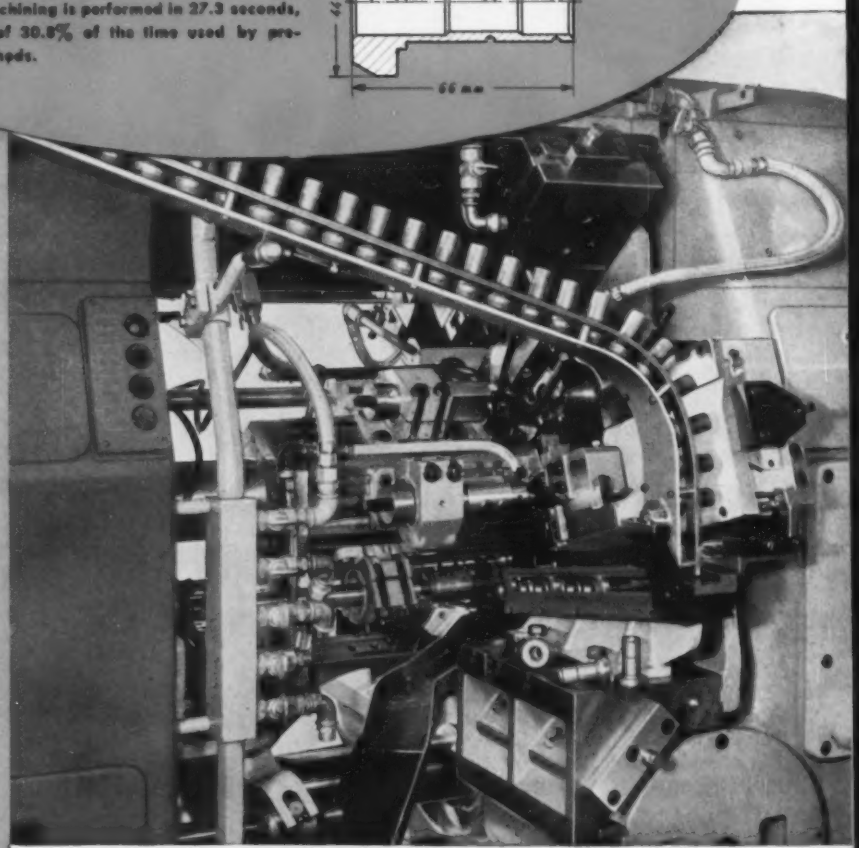
ROUGH TURN HEAD
FACE
DRILL LARGE HOLE

2ND POSITION



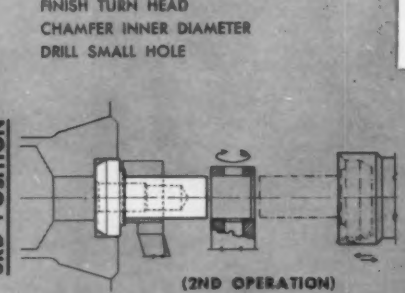
(1ST OPERATION)

FINISH TURN HEAD
CHAMFER INNER DIAMETER
DRILL SMALL HOLE



RÜCKANSICHT MIT MAGAZIN EINRICHTUNG
REAR VIEW WITH MAGAZINE LOADING ATTACHMENT

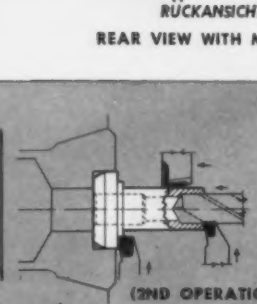
3RD POSITION



(2ND OPERATION)

TURN OVER AND RELOAD

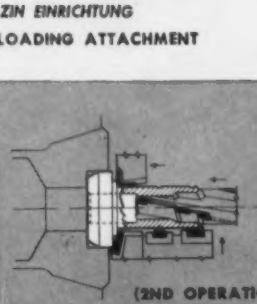
4TH POSITION



(2ND OPERATION)

TURN SHANK DIAMETER PARTWAY
FACE BACK OF HEAD
FACE END OF SHANK • DRILL

5TH POSITION



(2ND OPERATION)

TURN SHANK DIAMETER REMAINDER • FINISH FORM COLLAR BACK OF HEAD AND GROOVES • FINISH DRILL TWO DIAMETERS WITH STEP DRILL

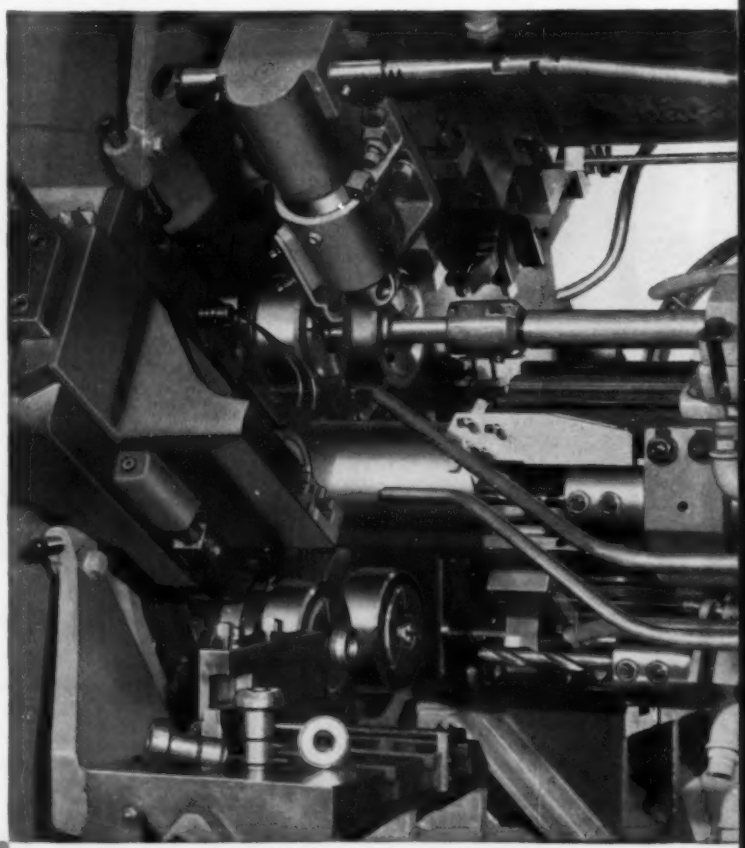
. . . where there's work to be done and time to be saved . . .

there's an Acme-Gridley to do it!

In the metal working plants of Essen and Hamburg you'll often hear the phrase ***Schnellste Automatiche Fertigung.*** Chances are, ***mit Acme-Gridleys,*** is added for ***Schnellste Automatiche Fertigung*** means high speed automatic production and all 'round the world the use of Acme-Gridley Automatics results in high speed production ***and*** greater precision in metal working.

The illustrations show the production of an automotive sleeve which is tooled from an upset forged blank fed into the German built Acme-Gridley by a magazine loading attachment. After one end of the part is machined it is turned end-for-end by a special attachment and then the other end machined—the part completely finished.

This high speed—high quality production is typical of the way Acme-Gridley circumferential automation makes things faster—better—cheaper—all 'round the world. That's why we say "When there's work to be done and time to be saved, there's an Acme-Gridley to do it".



WENDE EINRICHTUNG LAGE 3
TURNING ATTACHMENT POSITION 3

why don't you
INDEX . . . to lower machining costs . . . with *Acme-Gridley*
CIRCUMFERENTIAL AUTOMATION

National Acme

THE NATIONAL ACME CO.
170 EAST 131ST STREET
CLEVELAND 8, OHIO
Sales Offices . . . Newark, N. J. . . . Detroit, Mich. . . . Chicago, Ill.

ND FACTS

Pine block serves as bearing for this undershot mill wheel powering a generator for electricity at a blacksmith shop in the Italian Tyrol. Constant flow of water from pipe provides lubrication.

Is pillow block inefficiency costing your plant money?

The need for relubrication of pillow blocks is *more* than costly today! It's *passé*. For New Departure's new pillow block line is built around the performance-proved Type AE adapter ball bearing with *Sentri-Seals*. Dirt, moisture and wear are sealed *out* . . . grease is sealed *in — for life!* Send for details about New Departure pillow blocks. Ask today for Catalog PBC-A.

These bearings are quickly and easily applied to shafting without special tools. They are positively locked in position with eccentric cam locking collar and set screw.

1908–1958
GM
FORWARD FROM FIFTY

ND NEW DEPARTURE
DIVISION OF GENERAL MOTORS, BRISTOL, CONN.
NOTHING ROLLS LIKE A BALL

Uranium Welding

Researchers find that argon-gas shielded tungsten arc process does a satisfactory job welding uranium. In comparing argon-gas shielded arc, coated metal-arc, and resistance spot-weld methods, tests show that argon-arc methods make a stronger, harder, though less ductile bond than parent metal. While coated metal-arc welding isn't satisfactory now, inert-gas-shielded metal-arc method may be workable.

Ceramic Tools Improve

Ceramic cutting tools promise wider applications than first thought possible. They're being used on tough alloy steels up to 65 Rc at speeds as slow as a few hundred feet per minute. In some cases they save a finish grinding operation. In others they do jobs carbides can't touch, such as on gear blanks, truck axles and tool steels.

Cut Cost for Reactor Part

A silver-base alloy containing indium and cadmium serves as a reactor control rod. The alloy, costing about $18 per lb in ingot, is extruded in cruciform shape for half the final cost of the previously used metal. Ingots up to 210 ft long can be continuously cast.

Numerical Controls Pay

Numerically controlled machine tools pay off in materials savings through precision. One major airframe builder claims a weight savings of 160 lb on one large wing forging due to more accurate machining. A recent survey shows such cases are not unusual. Lack of application data and high initial cost are big handicaps to wider adoption of such equipment.

Foamed Metal Cores

Developed for comparison with plastic foams, foamed metal is being made for sandwich-construction cores. The metal foam has 1/16-in. cells and density of 15 psi. It's made by melting a base alloy of 95 pct aluminum and 5 pct magnesium and adding 2 pct zirconium hydroxide as a foaming agent. The metal solidifies after being foamed by hydrogen released from the hydride.

Magnetic Rubber

It's produced by compounding Neoprene or other rubber or plastic substances with permanent magnetic materials of small particle size. The magnetic properties hold promise of many applications for the new material in handling ferrous metals. It has shown good service as roll covering on an automatic stacker and feeder.

Light Retards Copper Oxide

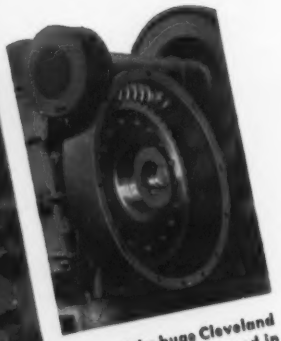
Sunlight or other intense light, which ordinarily speeds corrosion in metals, has been found to produce the opposite effect on copper oxidation. Tests show that irradiation retards copper-oxide growth on single crystals immersed in water. A possible explanation is a copper-cuprous oxide photocell theory. Irradiation would cause an electron flow into the metal from the cation-deficient film of Cu_2O.

Bearings for Small Cars

Low-cost wheel bearings have been developed for use in small cars of European type. It suggests current U. S. automakers' thinking on possible wheel bearing requirements for small cars to be built in this country. The two bearings (1.98 and 1.57 in. diam) also can be used for boat trailers, farm machinery, and conveyors.

Quick Seating Valve

A heavy duty valve of 12 in. and over in diameter allows one man to seat the valve in 4 minutes. It's done through a combination of inertial torque and gearing to which an air wrench is applied. The valve costs very little more than hand operated types, and yet allows one man to do a job that would take three men substantially longer on a manually operated valve.



View of the huge Cleveland Worm and Gear set used in this 150 Series All-Steel Shear, built by The Cincinnati Shaper Co.

CLEVELAND gearing helps this giant shear 1½" steel plate

THE terrific pressures generated in cutting a 1½" steel plate 12 feet long are as nothing to this giant shear. Reason: Because there is plenty of extra power, transmitted through Cleveland Worm Gearing.

Whenever a drive must operate under extreme pressures, there you'll find Cleveland Worm Gearing at its best. And a Cleveland drive stays dependably on the job no matter how severe the service. It doesn't wear out—its efficiency actually improves with use.

Write for Bulletin 145 which illustrates the many types and sizes of units available in Cleveland Worm Gear Speed Reducers and Drives. Our sales representative near you will sit down with you at your convenience to analyze your drive problems and help you select Clevelands best suited to your needs. The Cleveland Worm and Gear Company, 3282 East 80th Street, Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers, Limited.

CLEVELAND
Worm Gear
Speed Reducers

Durable Goods Makers Hope To Reverse Consumer Psychology

Production Lags Behind Replacement Market

Producers know the market isn't as bad as their production rates indicate.

Many believe that psychological problems may be greater than economic.

Consumers defer major expenditures while income declines.—By R. D. Raddant.

▪ Refrigerator manufacturers had dismal feelings when January shipments were totaled up. With only 196,000 shipped, it was the poorest month since World War II.

While refrigerators may be an extreme example, the situation isn't much better in most consumer durables. The decline in this sector of business is a principal factor behind the depressed status of most of the metalworking industry.

Most Are Down—A rundown of some product shipments early this year compared with similar periods of last year shows the seriousness of the market decline.

Refrigerators are down 33 pct; clothes dryers, down 31 pct; washing machines, down 28 pct; ranges, down 26 pct. Auto production is down over 30 pct. There is one notable exception: Makers of farm equipment are doing much better, hope for a year equal to or 10 pct better than last.

What has happened to demand? The answer to this question may hold the key to the present recession.

Started in 1955—The decline in demand for consumer durables began back in 1955, long before the 1955-57 boom showed any signs of leveling. With the capital equipment boom in full swing, the declines had little effect on the overall economic level, although signs of trouble had been apparent for some time.

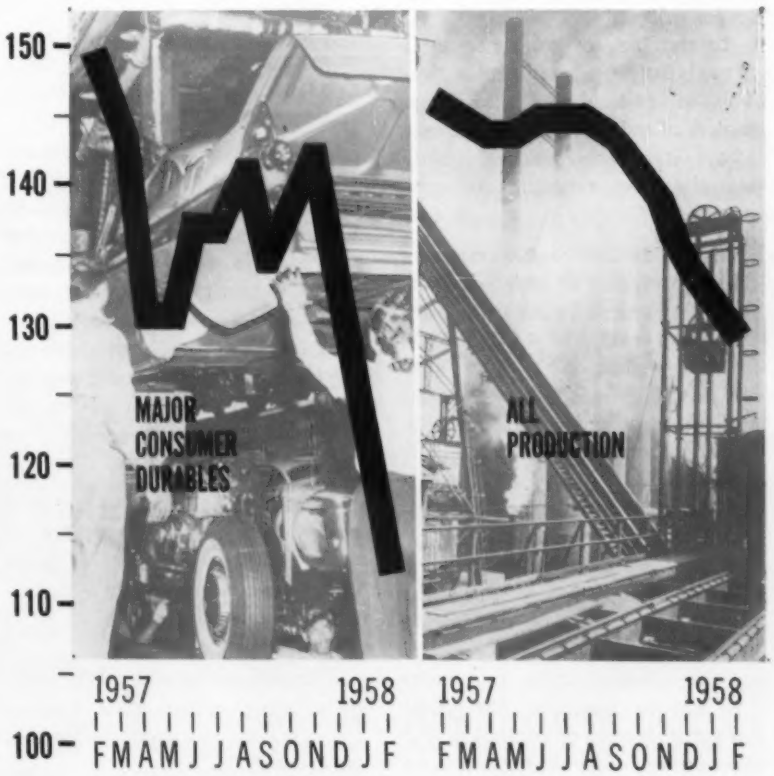
Always a volatile sector, production of consumer durables showed major fluctuations throughout the decline. But rebounding always fell short of previous peaks, declines went progressively deeper. The really serious drop began late in 1957.

No Quick Upturn—Now the optimists are those who believe the bottom may soon be reached. Others do not see an uptrend for some months.

There are a few broad explanations for the decline: Market satura-

Consumer Durables Lead the Decline

FRB Index of Industrial Production, Seasonally Adjusted



Little to Cheer in Consumer Durables Picture

	How Current Shipments Compare with 1957	The Outlook
Autos	**Down 32 pct**	**Seasonal upturn may develop.**
Farm Implements	**Up 10 pct**	**Hopeful.**
Ranges	**Down 26 pct**	**Depends on home building.**
Refrigerators	**Down 32 pct**	**Current rate less than replacement.**
Dryers	**Down 31 pct**	**Small gains ahead.**
Washing Machines	**Down 28 pct**	**Moderate improvement.**
Electric Housewares	**Down 35 pct**	**Better things ahead.**

tion; lack of consumer confidence; unaggressive selling; and decline in personal income combined with higher prices.

Lately, lack of consumer confidence is the most heard explanation. This is particularly true among leaders of industry and government, whose statements, understandably, are aimed at restoring consumer morale.

Money Is There—Exponents of this theory point to high individual incomes, increased savings deposits, and other evidences of individual financial well-being.

Chris J. Witting, Westinghouse vice president and general manager of its consumer products group, puts it this way:

"The major challenge to appliance-television manufacturers, as well as to all manufacturers in the durable goods field, is to change the present psychology of the buying public.

"The situation today is a paradox. On the one hand, the public has cut its buying of appliances and other durables very sharply. Yet, on the other hand, it never was in such a good position to buy and values have never been so substantial. . . .

United Effort Needed—"To me, this situation provides ample indication that the public is uncertain, confused, wary of the future."

Mr. Witting calls for vigorous advertising, sales promotion and merchandising effort, to be joined in by utilities, banks and other interested groups. He also urges complete news coverage of economic developments.

"Complete coverage of what's going on, presenting the sweet with the bitter, would go a long way to offsetting consumer apprehension," he says.

Is Market Saturated?—Mr. Witting's beliefs are fairly typical of official industry opinion. But many others are concerned over other factors. One is the possibility of a saturation of the market.

This will stir up all kinds of arguments among economists and industrialists. For some products, the talk is academic.

For example, even assuming a high rate of saturation of the refrigerator market, recent shipments have been below the normal replacement market. Furthermore, it's generally believed that only a handful of appliances are over 50 pct of market saturation.

In addition, it's difficult to put a figure on saturation.

"You never hear anything about saturation while income is going up," one Dept. of Commerce official remarks. "It's only when things look a little sick that you hear talk about it."

Easily Deferred—Tied in with income is price. While there has been no significant change in "real" income since late 1956, prices have continued to go up. This does not apply to all products, particularly not to appliances, but the squeeze on the consumer's dollar is increasing. Few consumers would argue the appliance maker's contention that they are getting more value for less these days. Even so, they probably feel they have less money to spend, or to commit on credit.

Most consumer durables are easily deferrable, from the buyer's point of view. So in times of uncertainty, it's easy to postpone that purchase for a short time to an indefinite period.

New Model Impact—Nor do new models appear to have the appeal they once had. By and large, the appliance makers have not been able to design obsolescence, and the replacement market has not been stimulated in this way.

And the auto industry has uncomfortable feelings that its ability to create a new demand with a new design is falling off. However, there is no evidence that any manufacturer is going to decrease his efforts in this direction.

Not Like 1954—Some contend there is little similarity between the previous declines of 1949 and 1953-54. At that time there was a much greater demand for the products, plus a pent-up need for capital goods to stimulate employ-

ment and general business.

While there is still a demand for most consumer durables, and a strong one, it has lost some of its urgency. And, it can be postponed or delayed for indefinite periods.

Short Term Factors—Also working against manufacturers are some short term factors.

One is inventory. Retailers and dealers the country over are engaged in reducing their stocks. To a large extent, the manufacturer is carrying retail inventories.

Another is credit. Although financing is relatively easy, the level of consumer credit is still high. Many are reluctant to extend their own borrowing in times of uncertainty.

A third, and probably most important for the short term, is the deterrent factor of possible price cuts or possible cuts in excise taxes.

Plus Factors—What could stimulate an upturn in consumer goods? The plus factors in the market are not as readily seen as the negative ones, but they are there. A combination of relatively minor or temporary factors could touch off a long sales uptrend.

Here again, inventory is a factor. Like refrigerators, many durables are being turned out at less than replacement rate and inventories are at or near the bottom, very low even by current sales rate. A pickup would put many into immediate short supply.

Tax cuts could help. This is a matter of debate, but most believe a significant tax cut could help spending, even to a significant degree.

Time to Step Up Effort—More important, probably, is the combined effort of business people to do their own stimulating. Westinghouse, practicing what it advocates, for example, will step up its spending 10 pct on advertising and merchandising. The company spent $16 million restyling its 1958 lines.

The auto industry is also stepping up its promotion. Advance tooling reports indicate there will be significant model changes in 1959.

Aluminum Price Cut

All major U.S. producers drop prices 2¢ per lb. April 1.

Move is made reluctantly, spurred by announcement of a cut by Aluminium Ltd.

▪ The first break in the price of primary aluminum in 17 years came late last week.

Aluminium Ltd. shed its traditional role of follower in the U. S. price picture to slash the price of its ingot by 2¢ per lb.

Canadian Cut — The Canadian producer sells commercially pure ingot in the U. S. at the pig price. The new price is 24¢ per lb, effective April 1.

The Big 3 domestic producers were "surprised," "shocked," and "unhappy." They had been considering a price move in the other direction. They are committed to wage hikes this summer, under their contracts with the United Steelworkers.

Nevertheless within 24 hours all had gone along. New mill prices were scheduled to be announced early this week. The new U. S. pig price was actually set by the domestic companies. Aluminium had announced a world-wide price cut of up to 2¢ per lb, but had not pegged the U. S. level. One of the Big 3 said it moved on the basis of the new Aluminium price for its Canadian customers, which had been cut 2¢, to 22½¢ per lb.

Might Not Last—There is some speculation that the lower price might not last too long. A spokesman for a domestic producer said labor costs in 1958 would increase at least as much as last year. He didn't see how his firm could absorb another wage boost.

Why the cut? Aluminium president Nathanael V. Davis said, "It is our conviction that today's action (price cut) will make aluminum more competitive with other materials . . . and thus will open up new application for our product."

Hope it Will Help—A vice president of a domestic producer said he was hoping, but was not at all convinced, that the lower price would help expand aluminum's markets.

A stainless steel producer concedes, "This makes things more competitive, but the area of competition is fairly narrow."

A spokesman for a U. S. producer says, "I personally don't think the lower price will sell one additional pound of aluminum."

A spot check of purchasing agent buying other materials for some of the applications aluminum seems to be aiming at indicates the lower price will have little effect.

Russian Competition—Some observers speculate that Russian competition with Aluminium Ltd. in the United Kingdom is behind the price reduction in Canada and the U. S. Russia has been underselling Aluminium by about 2¢ per lb. Aluminium has been using so-called "loyalty discounts" to keep its U.K. customers — a 2 pct discount to firms which continue to buy their historical ratio from the company over a period of time. Apparently this hasn't been enough.

Aluminium Ltd. decided to meet the Russian price. This would have weakened the Canadian price structure, say observers, so it was dropped in line with the U.K. price. This meant the U. S. price had to fall.

Product Mix—A spokesman for another U. S. producer blamed the lack of product mix. "Many of our products are sagging badly today," he said, "but some, like our foil, are taking up the slack."

Leonard Starr, president, Aluminum Extruders Council, "heartily endorsed the reduction." He said it was "long overdue," and that the former price of 26¢ for pig was "unrealistic."

MANAGEMENT: Louis G. Seaton, GM vice president, and Earl R. Bramblet, director of GM labor relations, right, get ready for negotiations.

LABOR: Walter Reuther, UAW president, right, and Leonard Woodcock, director of the UAW's GM department, prepare to state union's demands.

Who's Got Upper Hand in Auto Contract Negotiations?

This could be the auto companies' year to call the turn on new contract terms.

Business outlook will be deciding factor in outcome of bargaining.—By H. R. Neal.

▪ Is this the auto companies' year to take charge of their contract negotiations with the United Auto Workers?

The answer probably depends on how soon we fight our way out of the business recession. A continuation of the economic downtrend is likely to stiffen automotive management's resistance to Walter Reuther's demands.

Negotiations Start—It's not hard to risk a strike when your product isn't selling anyway.

This was the situation as auto labor negotiations got underway in Detroit last week, amid the usual atmosphere of strained jocularity. A few handshakes later, the doors were mercifully closed and management and labor settled down to the practical matter of hammering out a settlement.

Union Demands — The union's most controversial demand is expected to be for a 25 pct split of profits in excess of 10 pct on net capital before taxes. The companies have labeled this one "socialistic." This could be trading bait for more conventional economic demands.

The union also is hoping for: An increase in the annual productivity improvement factor, a one-year contract, improved supplemental unemployment benefits, compensation for moves and transfers, company-financed hospital-medical insurance, pension improvements, elimination of wage inequities between plants.

What It Would Cost—Industry estimates of what all this would cost: 35 to 45 cents per hour. Guesses on cost of final settlement: 9 to 12 cents an hour.

General Motors would like to extend the present contract another two years. The company seems willing to settle in terms of money, but something less "radical" than the union's profit-sharing scheme.

GM's contract expires May 29; Ford's and Chrysler's on June 1.

For the present, greatest attention will be focused on General Motors and its negotiations.

Who Negotiates—Heading GM's eight-man negotiating team is Louis G. Seaton, vice-president—personnel, and Earl R. Bramblett, director of labor relations. A battery of specialists and divisional personnel managers are on hand to back up the regulars and cover their own

BLACKOUT: Door closes on negotiations, presumably until settlement or breakdown.

particular territories.

Reuther, UAW president, and Leonard Woodcock, director of the union's GM department, have a basic negotiating team of 14 with them. However, Mr. Reuther, who also attended the opening of Ford and Chrysler talks, and many of the union's experts must spread themselves around all three auto companies.

Strained Banter—Here are examples of the exchanges between management and labor at the start of GM's negotiations:

After several handshaking poses for photographers, Mr. Reuther quipped to Mr. Seaton: "After the second shot, we're on overtime."

Two Sides To Question—Statements by the two at the opening of the session emphasized a desire for a contract which is "economically sound" without resorting to a strike.

Behind Closed Doors—If all goes well during the coming weeks, little else besides the opening comments will be heard "officially" from the parties until someone signs a contract. Reason? Shortly after the Mr. Reuther-Mr. Seaton repartee, the door to the conference room closed. Traditionally, negotiations are secret until a settlement is reached or a strike is called.

Ford has been more outspoken in its denunciation of Mr. Reuther, his union, and their demands, branding each and all a threat to the nation. The company has called for this to be the time to stop the UAW. In this, some Ford statements seem deliberately designed to make it a strike target. Ford executives have even said the firm will be the one to take the strike, if one develops.

Ford Trial Balloon? — At the same time, it has been reliably stated Ford has confided to some reporters that the firm would have to surrender to the union after only a two-week strike. It's difficult to understand why Ford would make such a statement, even in all confidence, to anyone outside a select group of its own executives.

One possible explanation: Ford would like industry-wide bargaining. GM said in December it would go it alone. Ford, then, hopes the word gets back to GM about its vulnerable position, using it to prod GM into one-for-all sessions. At least, the thinking could go, the whole industry would shut down at the same time—not just Ford.

Profit-sharing Not a New Idea

▪ Profit-sharing plans aren't new, but UAW's demand for a profit-sharing program marks the moment when history has made the full circle.

The first drive for profit-sharing came in the 1880's, when Carroll D. Wright, labor leader and first U. S. Secretary of Labor, authored the idea with strong union backing. It died, but was revived by management as early as 1916. Now it's a UAW bargaining point, though the union, in common with considerable other labor sentiment, came out strongly against profit sharing in 1949.

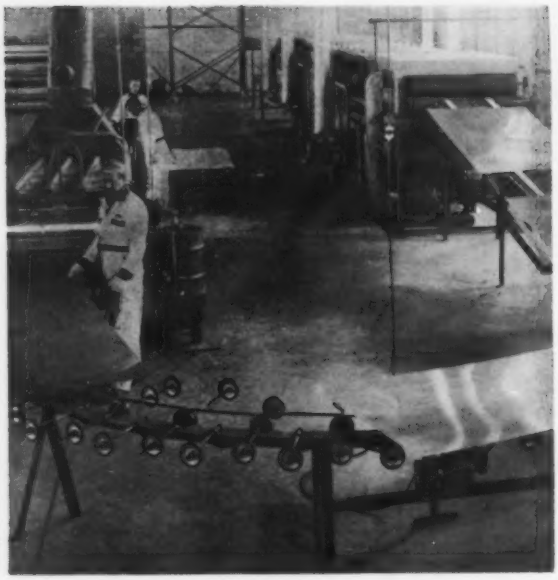
Number of Plans—There are an estimated 25,000 profit sharing plans at present, including several already UAW-organized shops. Though few unions have denounced profit-sharing as strongly as did the UAW in 1949, veterans of the movement recall that it's always been more difficult to initiate profit-sharing in strongly unionized industrial areas.

Despite this mild foot-dragging, new "deferred payment" profit-sharing plans are born at the rate of 10 per day. The Bureau of Internal Revenue keeps tabs only on deferred payment plans, so the number of cash-bonus, "pay-as-you-go" plans isn't known. The growth rate has been phenomenal, from five deferred plans in 1930 to an estimated 14,000 plans in 1957. It's been estimated that there are about as many cash plans as deferred plans.

Sharing Versus Bonus — Again an estimate—about 27 pct of employee benefit plans were profit sharing in 1946, with the remainder as pension or stock bonus plans. By 1956 profit sharing was 39 pct of the total; by 1958 about 45 pct.

Metalworkers have been pioneers in the movement: Vanadium-Alloys Steel, Lincoln Electric, Pitney Bowes, Wheelbrator, Cleveland Twist Drill, Flexonics, Signode Steel Strapping, Quality Castings, Commercial Steel Treating, Chromium Mining & Smelting.

Productivity Angle — Employer enthusiasm for profit-sharing stems from the increased worker productivity that begins to develop as the employee sees that he has a real share in the company's financial health. In addition, the profit-sharing plan has worked harmoniously with existing incentive plans. It's been found that a good plan can produce results even in a depression period.



BEFORE BONDING: Steel sheets move by conveyor from cleaning tank (right) to adhesive application.

AND AFTER: Light rolling pressure has bonded vinyl plastic sheet to the adhesive coated metal.

Metal and Plastic Join Forces

Plastic-coated sheets are finding a major market as metal-working materials.

Range of applications is widening. Automotive and construction provide the greatest potential.—By G. G. Carr.

■ If you can't lick 'em, join 'em. This old bit of advice is rapidly becoming the rule with metals and plastics. Often thought of as competitive, combinations of the two are yielding important new metal-working materials.

Plastic-coated metal sheets are a major case in point. Under the currently most popular method, the Marvibond process of U. S. Rubber's Naugatuck Chemical Div., vinyl sheets are continuously bonded to metal sheet by heat and pressure.

One major lincensee, U. S. Steel, is also working with plastisol coating, but its products are not yet in commercial production. The Marvibond process yields a vinyl-metal laminate, with vinyl on one or both sides of the metal core, combining the strength of the metal core with the properties of the plastic coat. Core metal may be steel (including galvanized), copper, brass, aluminum or magnesium. The vinyl may also be bonded to plywood or composition board.

Wide Potential—Since the vinyl can be supplied in virtually any color and texture, the laminates open up many new design possibilities for metal in a wide variety of fields. The excellent dielectric properties of the plastic have proved important in electrical and appliance uses, and vinyl's corrosion and abrasion resistance makes it a superior finish for a wide range of applications. The laminate can be formed after bonding, speeding production and greatly simplifying finishing operations.

Growth of the process is impressive. In 1955, about 1 million sq ft were produced in the U. S. alone; in 1957, licensees in this country and Europe turned out 18 million sq ft. Naugatuck estimates that combined output in 1960 will hit 140 million sq ft.

The Customers—Market potential is broad. Chief markets to date have been transportation equipment (interior panels), furniture, large and small appliances, construction (doors and panels), luggage and carrying cases and a broad miscellaneous category including small stampings and machinery housings.

Detroit is an important customer. Ford's new Thunderbird has nine applications of the laminate, and Cadillac, Chrysler, Pontiac and De Soto all also use the material in various quantities. New passenger railroad cars, planes and ships are all finding applications for the bonded sheets.

Big in Construction — Construction could dwarf other markets.

Panels and doors are proving they can absorb heavy traffic in offices, stores and similar buildings and remain fresh and attractive.

List of applications to date is lengthy. A sampling, in addition to uses already mentioned, might include TV cabinets, luggage, bridge tables, wainscoting, gun cases, boat deck covers, picnic jugs, oil burner housings, chemical drums, roofing tiles and jewelry boxes.

The Producers—Vinyl supply is plentiful, could easily become competitive. Plastics industry sources estimate that demand won't catch up with present capacity until around 1963. Already active in the field, in addition to Naugatuck, are Hood Rubber Co. and O'Sullivan Rubber Co., both of whom did important development work in the early days of the process. Unlike Naugatuck, Hood and O'Sullivan do their own laminating, while Naugatuck sells the vinyl and needed adhesives for laminating. Another producer is the Industrial Products Div., The Masland Duraleather Co., Philadelphia.

Sales to laminators are often partially indirect, since many have vinyl printing and embossing done by independent calendering firms using special formulations developed by Naugatuck. Actual laminating process is comparatively simple. Cleaned metal sheets are coated with adhesive, heated, then fed into a roll laminating machine. As the bonded sheets leave the laminator, they are cut apart and cooled. They are then ready for further fabricating.

It's Versatile—An important feature of the laminates is that the vinyl coat imposes virtually no limitations on forming. The sheets can be sheared, punched, drilled, stamped, roll-formed, bent in a press brake and deep drawn without damage to the vinyl. The only limitations are those of the base metal.

Millisecond spot welding on the metal side of the laminate without damage to the vinyl can now be done with equipment designed by Arvin Industries, Columbus, Ind., and Precision Welding Co., Cincinnati.

New Coloring Process

▪ A new coloring process for stainless steel and other metals now permits parts to be severely formed without surface damage.

Developed by Union Carbide Corp.'s Electro Metallurgical Co. division, the new "Permyron" process provides a corrosion and abrasion resistant color coat. Costs are described as substantially lower than conventional coloring methods as anodizing.

Many Colors Coming—Black is the only color produced commercially at present, but Electromet hopes to have a full range of colors available by the end of the year.

Electromet has proved the process on stainless and carbon steels, titanium, magnesium, and aluminum, sees no reason why it will not work on all metals.

Until patent processing is completed, Electromet limits description of the process. It's indicated, however, that temperature and atmosphere controls are critical parts of the process.

Many Uses—Although originally developed for architectural applications, a wide range of applications may develop, especially since it may be applied either before or after fabricating.

It also may be used in the uncolored state to take advantage of its corrosion-resistant properties. Costs here are described as competitive with bonderizing and Parkerizing.

Coloring is durable, and resistant to most environments where the process would be employed.

Electromet will not perform the coloring process commercially, although it is producing on pilot facilities for Union Carbide's new office building in New York and the Canadian office of Atlas Steel. Licensing was started on a nonexclusive basis this week.

The company reports capital outlay is low, with equipment and pigments all standard items.

IT BENDS: These stainless panels were textured or bent after formed by new Permyron process of Electromet. Possibilities are extensive.

Man's First Space Flight Due

■ Man may keep his date with space sometime next year. The half-plane, half-missile to take him there and bring him back is now under development. It's the X-15, being built by North American Aviation for the Air Force, the Navy, and the N.A.C.A.

The pencil-thin craft with cleaver blade wings is designed to coast in a ballistic curve similar to that of an artillery shell after its initial missile-like acceleration. It's the first vehicle built to withstand "thermal thicket" temperature and return.

A Mile A Second — The X-15 will glow red (like a blacksmith's forge) as it plunges into the earth's atmosphere. However, the plane will go through the critical temperature area so swiftly that the softening heat will not damage it.

Speeds of over 3600 miles an hour or faster than one mile a second will be achieved. This would be fast enough to fly from New York to Los Angeles and arrive there two-and-a-half hours before take-off, allowing for changes in time zones.

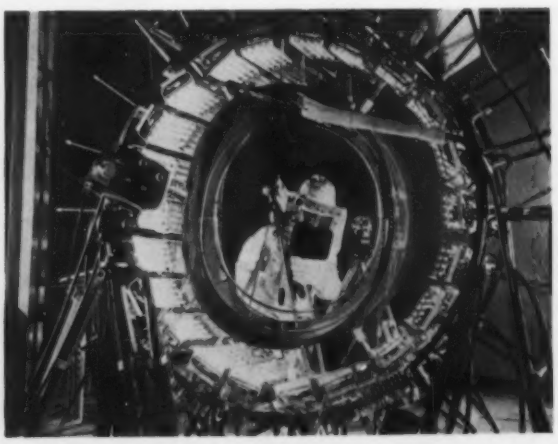
Stainless steel will be used extensively in fabricating the X-15, forming the entire skin and wings of the craft.

Fabricating techniques used, many differing from those on conventional aircraft, are expected to set the pattern of future families of airplanes. More welding has been done because the X-15, in contrast to one-mission missiles, is expected to make many flights. Greater strength will result from a structure 65 pct welded and only 35 pct fastened.

INSPECTION: Seamless weld in fuselage is examined. About 65 pct of plane is welded structure.

TIGHT JUNCTION: Brazing, rather than fastening, is used for tighter joint in pressure lines.

WELDED STRENGTH: Stainless steel fuel tank, moved by hoist, is among seam welded parts in X-15.



TORTURE TEST: Fuselage metal gets structural check after test by simultaneous heating and cooling.

During'59

Testing Refinements — Heating rate of the X-15—70 times faster than a F-107 jet—and its wide temperature range (1000 degrees above zero to 300 degrees below zero) made necessary special test setups.

More lab ingenuity was needed for the X-15 than for any other North American plane.

In previous heat testing on North American's F-100, for example, only 250,000 watts power output was required. However, X-15 components are subjected to 870,000 watts (the equal of 8700 light bulbs of 100 watts).

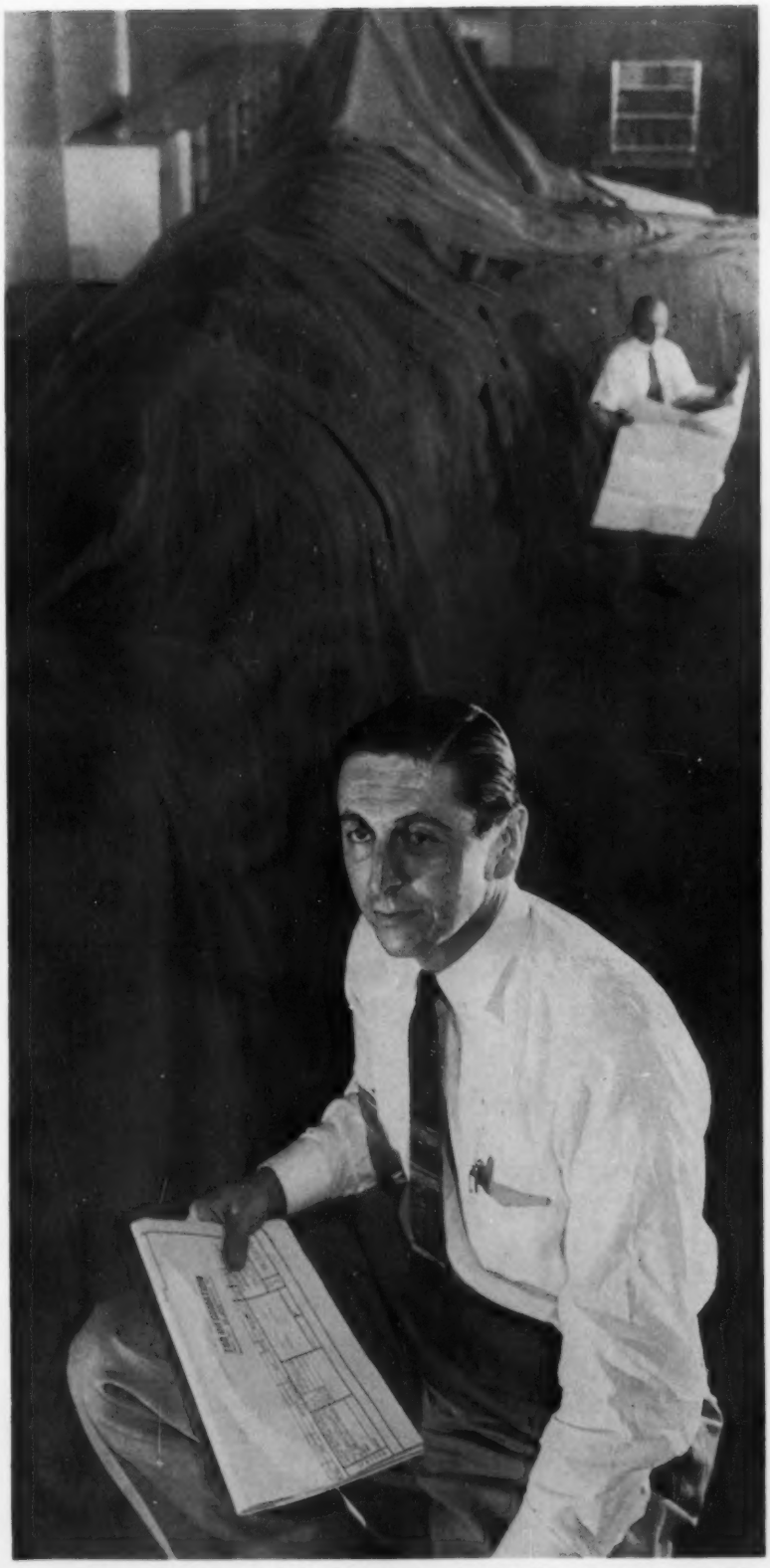
With a plane like the F-100 the chief concern was environmental heating, as in the engine tailpipe. In the X-15 aerodynamic heating of the plane's entire skin must be considered.

Another contrast: In temperature testing the X-15 heat is a function of time. Previous testing only considered steady heating and constant temperatures. In present tests, temperatures must be reached within measured time intervals.

Popping Shoe Halves—Research for the X-15 is conducted with a small stainless steel model loaded with instruments able to record 300 temperatures and 250 aerodynamic pressures at the same time.

Its function is checking on the thermal stresses the X-15 will undergo. Wide temperature variation occurs because refrigerated air will be blown through many areas to cool fluids and systems.

Here's how the stresses produced are studied on the model: A unique shoe arrangement encloses the test unit in a flow of cooling air at room temperature while air within the test tunnel is heated. When the heated blast reaches test speed, the shoe halves pop apart. Then thermocouples and pressure taps go to work measuring aerodynamic heating rates and pressure coefficients all over the model.



OUTER SPACE PILOT: First flight in the X-15 will probably be made by Scott Crossfield, North American test pilot. Full scale model of the half plane, half missile is kept shrouded for security reasons.

U.S. Steel Launches Major Ad Effort

▪ Following a two-and-a-half-year sales survey, U. S. Steel Corp. is making ready a major facelifting job on its merchandising and advertising programs.

The corporation's "New Look" campaign will begin late in April. Its goal of "holding and extending public preference for steel" over other materials will hinge on five lines of action:

1. A new advertising theme emphasizing to the public that "today's USS steels lighten your work . . . brighten your leisure . . . widen your world."

2. A new label program which will be offered to manufacturers of consumer products to identify clearly all items made of steel irrespective of whether it is USS Steel.

3. A restyled USS trademark.

4. A uniform and streamlined identification program to enable the public to more clearly interrelate U. S. Steel with all of its divisions.

5. A "Steel Plus" advertising program beamed at direct users of steel, featuring U. S. Steel's special marketing assistance to customers, and its metallurgical, research, and facilities services.

Explains R. F. Sentner, executive vice president, sales:

Industry to Benefit—"This new merchandising program will herald all steel—not just U. S. Steel products. To the extent that this program increases the total steel market, U. S. Steel will benefit through its share of increased sales."

The familiar USS trademark has been restyled but not extensively because the survey revealed there is a high degree of identification among consumers of the letters USS and U. S. Steel.

PREVIEW: Above is a typical ad spread which U. S. Steel will use to promote consumer products made of steel. Panels depict (l. to r.) how steels "Lighten your work . . . Brighten your leisure . . . Widen your world." The slogan is central theme in campaign soon to begin.

Wage Hikes Loom for Valve, Pump Firms

Makers of valves, pumps, and compressors can expect a union drive to bring their pay rates up to the level of basic steel.

United Steelworkers of America spelled out this objective in a planning session for contracts expiring this year. Fifty-five local unions with 23,000 members will negotiate new pacts in 1958. Full USW membership in the valve and pump industries comes to about 52,000.

Union Goals—First aim of the union is to secure uniform expiration dates for contracts in the two industries. In this year's talks, USW will push for contracts that end in the second half of 1959—at about the same time as most of the carryover group.

Ultimately, the union wants full equality with basic steel in straight pay and all fringes. As it stands most contracts in the pump and valve industries do not provide SUB or cost-of-living escalators. Overall rates, including fringes and wages, run 80¢ to $1.00 behind basic steel, says the union.

Demands Kept Secret—No timetable has been set by USW for the equalization process. No specific demands have been revealed. Union officials did say that basic steel wages, including cost-of-living hikes, will go up about 25¢ on July 1. They made it clear, however, that this would not necessarily be their asking price for new contracts this year.

J&L Elects Beeghly

Charles M. Beeghly was elected executive vice president of Jones & Laughlin Steel Corp.

The one-time president of Cold Metal Products Co. brings to his new office a broad experience in production, sales, and financial phases of the steel business.

He joined Cold Metal Products in 1934 and remained with the company until it was purchased by Jones & Laughlin in 1957.

NEWS ITEM No. 4 – 1958 – NEW PLANT IN STURGIS, MICHIGAN

WHY EXPAND?

1. CONFIDENCE IN OUR CUSTOMERS
2. CONFIDENCE IN OUR COUNTRY
3. CONFIDENCE IN BOUND BROOK'S ABILITY TO GIVE THE FINEST SERVICE IN THE FIELD OF POWDER METALLURGY

BOUND BROOK

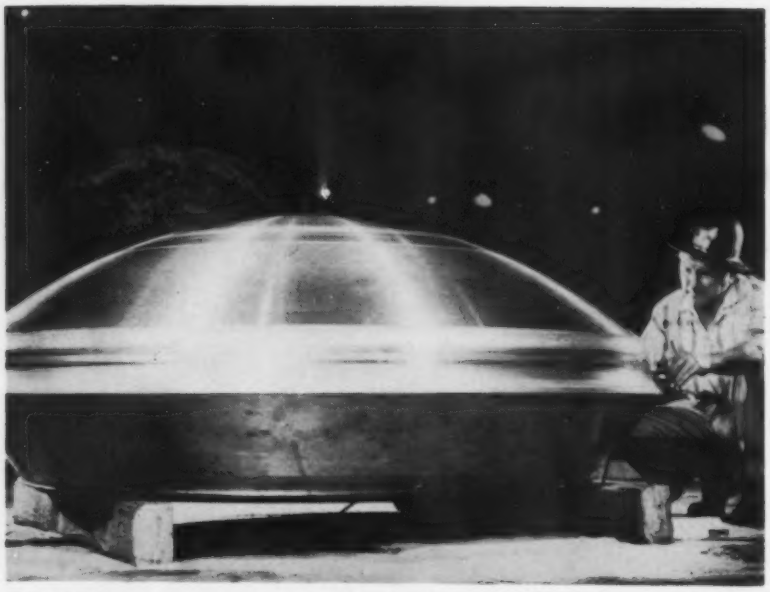
BOUND BROOK OIL-LESS BEARING CO., EST. 1883, BOUND BROOK, N. J.

Pioneer in

POWDER METALLURGY BEARINGS + PARTS

our 75TH year

Alloy 'Mushroom' Takes Shape



REACTOR LID: This huge mushroom-shaped forging being machined at U. S. Steel's Homestead Works is destined to become the dome section of a nuclear reactor. It was cast of manganese-nickel-molybdenum steel.

Valve Rating Increase Drive Lacks Speed

The case for a higher pressure standard for valves and boilers is developing, but only slowly.

Discussion may be active, but industry seems willing to wait and see. Most observers are quick to admit that pressure equipment capable of withstanding 15,000 psi is already in use, but only where temperatures are low. Offsetting these are petroleum processing plants where, though temperatures have increased, working pressures are being pushed down.

"Over 75 pct of turbines installed in the last 10 years are in the high-temperature, high pressure category and are in ratings of 75,000 Kw and higher," says J. J. Fleischmann, Allis-Chalmers Manufacturing Company.

Gains Noted — William Crawford, Edward Valves, points out that the advance in steam boiler pressures from 1350 psi and 950°F. is recent. Yet steam engineering has already pushed pressures to 2000 psi and 1050°F. At least one 5000 psi boiler for 1200°F. is under construction.

In a well documented report, it was pointed out that previous increases in valve and boiler standards amounted to a 66 pct gain in each new class created. Hence a 4500 psi standard should be in the cards.

The verdict at last week's power engineering conference: a 4500 psi standard may come, but it'll be a long time on the road.

Buyer Optimism

There are some hopeful signs on the horizon, according to the National Assn. of Purchasing Agents.

New orders, which showed a marked improvement in February, remained at about the same level in March. In a poll of purchasing executives, 24 pct reported a better new order position, 42 pct said orders remained at about the same level, and 34 pct noted a decrease.

The March figures indicate that the sharp downtrend in production may be ending, NAPA says.

Overall, only 7 pct of the association's members state they are paying higher prices; 79 pct say there is no change, and 14 pct say that they are now able to buy what they need for less money.

New Sintering Plant

Youngstown Sheet and Tube Co. has started building a new sintering plant at its Indiana Harbor Works, East Chicago, Ind.

When completed in about a year, the plant will have a capacity of 4200 net tons of sinter product daily with provisions for doubling the output later.

Among the modern design features will be ore screening equipment, dust collectors, a television system, sensing and logging devices for controlling sinter mixes, a weighing system, and an ignition furnace.

Contractor for the new plant is Arthur G. McKee & Co., Cleveland.

Canadian Expansion

Premier Steel Mills, Ltd., Edmonton, Alta., plans a $15 million plant addition.

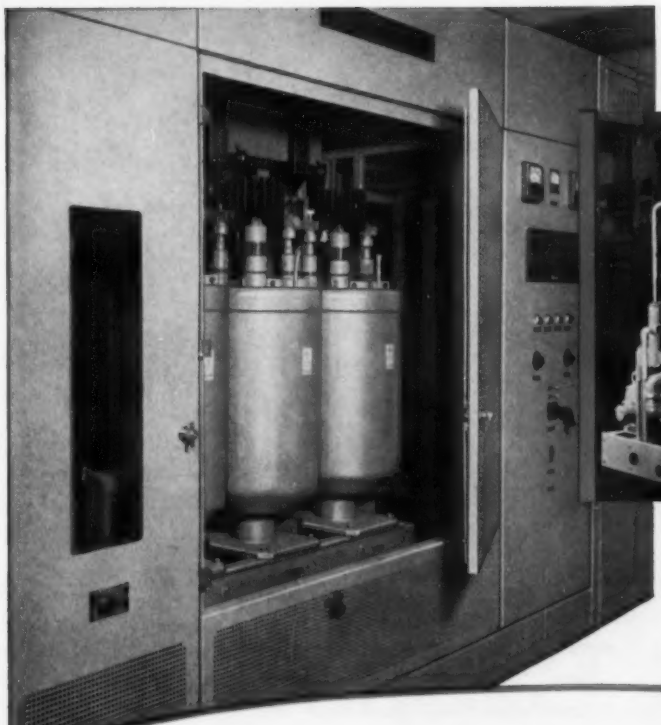
F. J. Bartholomew, vice president, announced that plans are in an advanced stage and construction is expected to start as soon as the frost is out of the ground. First production from the new unit is expected to start in 1959.

Additions include scrap melting facilities, iron ore development, and production of large structurals, plate, and skelp.

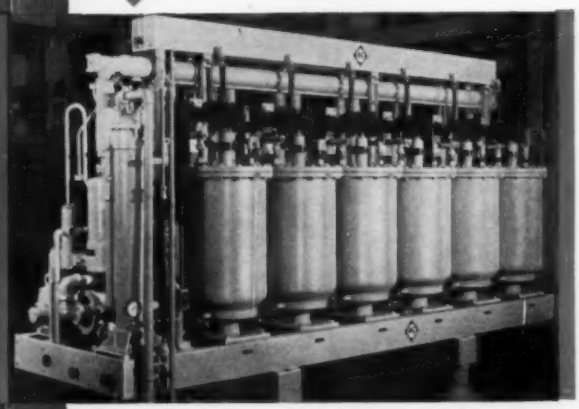
Army Signs Contracts

The Army currently is negotiating $100 million in contracts for its 1958 requirements of military trucks and trailers.

The contracts involve: Willys Corp., 250 mechanical mules; Chrysler Corp., 3200 three-quarter-ton trucks and 1000 one-ton trucks; Utica Bend Corp., 5000 two-and-a-half-ton trucks; Mack Trucks, Inc., 32 heavy-duty trucks.



Open pumped tube unit permits easy access for inspection. Easy to recondition in field.



Enclosed sealed tube unit conserves space, cuts installation costs, eliminates need for vacuum pumping system.

ALLIS-CHALMERS

Mercury Arc Rectifiers

Pumped or Sealed? Open or Enclosed?

Here's how Allis-Chalmers can help you choose a rectifier for your job—

BOTH sealed and pump-evacuated tube rectifiers offer distinct advantages, depending upon the application. Whether your rectifier should be open or enclosed construction also depends on the application. Since Allis-Chalmers offers you a choice of sealed or pumped tubes in either open or enclosed construction, you get an unbiased recommendation, based on a study of your needs, and not on commercial expediency. And you can be sure of unsurpassed reliability and ease of operation, as proved in hundreds of Allis-Chalmers installations.

Only Allis-Chalmers Excitron Rectifiers give you all these important advantages—

- **Fixed excitation anode** does not contact mercury — is independent of level, turbulence or impurities.
- **Continuous excitation** eliminates need for reignition — pilot arc always present.
- **Grid phase control** located in clean region near anode where ion density is lowest.
- **Internal cooling system** provides high heat transfer with seamless tube coil.
- **Arc-over-free tube** eliminates arc-over danger by insulating entire arc path.
- **Enameled anode seals** provide high strength, trouble-free seal.

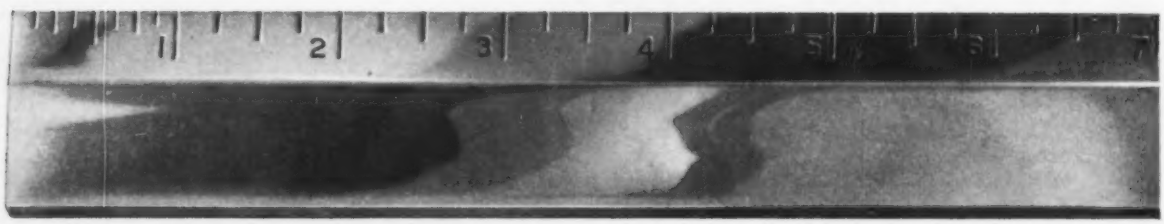
For detailed information on mercury arc rectifiers contact your nearest A-C office, or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin, for bulletin 12B8494.

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

A-5560

There's just One Rule at Bristol Brass...



To make every pound of strip, rod and wire the way we would want it, if we were buying it

Bristol-Fashion
means Brass at its best

THE BRISTOL BRASS CORPORATION • SINCE 1850, MAKERS OF BRASS STRIP, ROD AND WIRE IN BRISTOL, CONNECTICUT
Bristol Brass has offices and warehouses in Boston, Buffalo, Chicago, Cleveland, Dayton, Detroit, Milwaukee, New York, Philadelphia, Pittsburgh, Rochester, Syracuse.

Wallace B. Bainton

Keeping an Old Company Young

Staying ahead of new and vigorous competitors is a constant problem with established companies.

Here is how one venerable machine tool builder copes with the situation.

■ Browne & Sharpe Mfg. Co., which is observing its 125th anniversary this month, regards Wallace B. Bainton as an outstanding example of the success it has had with its policy of encouraging forward-thinking young men.

Mr. Bainton joined the company as a management trainee in 1925, after graduating from Brown University. He is credited with conceiving the plan for Browne & Sharpe's gravity conveyor system and has since become vice president and general manager of the Machine Tool Div.

WALLACE B. BAINTON: Teeing off at Wannamoisett Club.

Approaching a Problem—When he first became interested in automation back in the 1930's, Mr. Bainton learned quickly that automation means different things to different industries.

"For a tool builder, automation is not the same as it is for an automobile producer," he explains. The number of units made by a tool builder is considerably lower than in the auto industry. Precision and accuracy is more important than high-speed production.

Developing a Plan—But even under such conditions, Mr. Bainton saw that automation could be used by Browne & Sharpe. In the mid-1930's he carried out automation experiments on a centrifugal pump line. After trying out numerous ideas, he concluded that a gravity conveying system would work best.

Now the company claims to be one of the first in the machine tool industry to automate its shops. About 60 to 70 pct of the manhours that go into Browne & Sharpe's automatic screw machine are worked on automated lines.

"We are planning to extend the automation system to our grinding and milling machine lines," says Mr. Bainton.

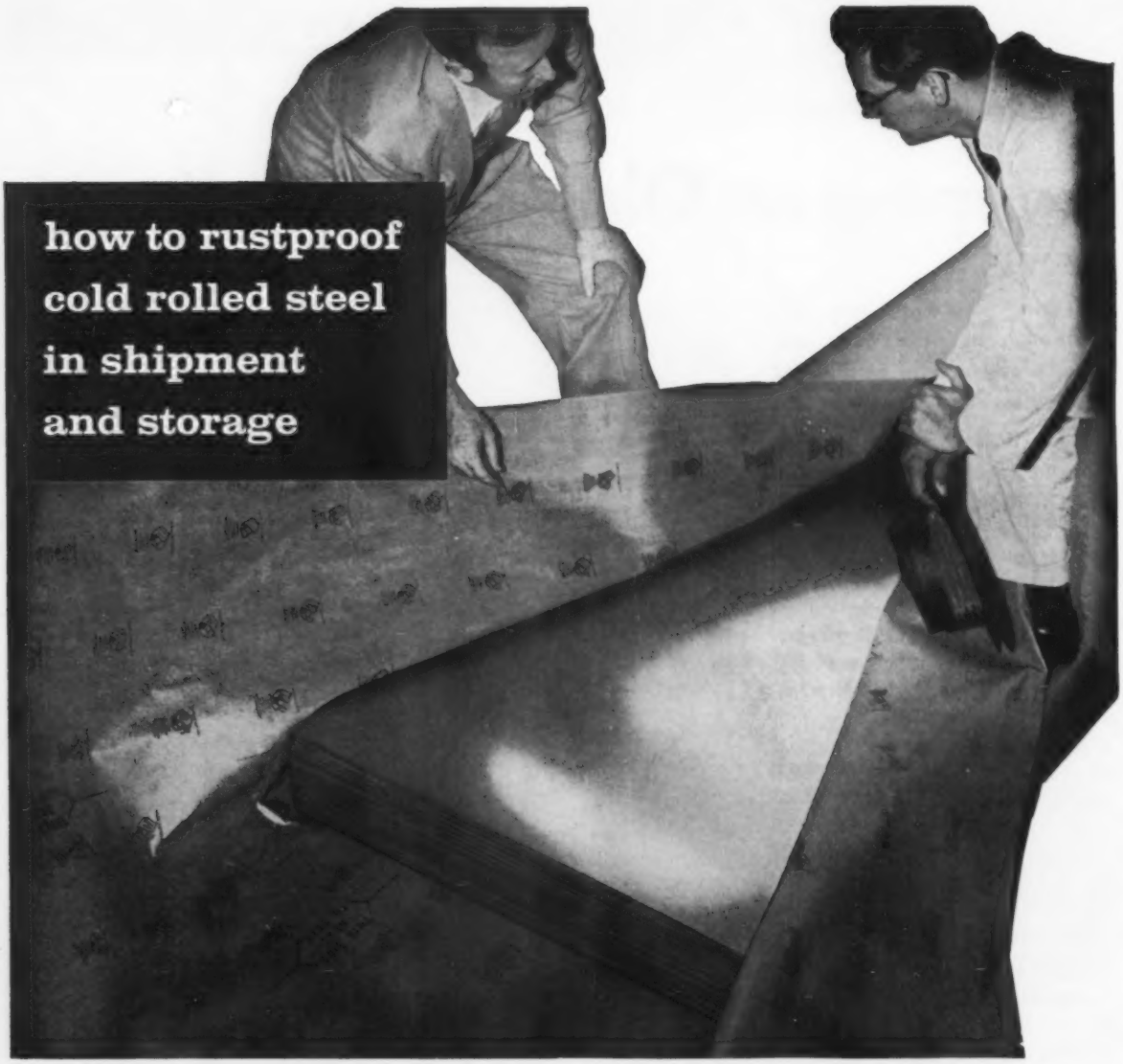
Policy Proves Out — New ideas put into effect by its young men invoke the creative interest and energy of top and secondary management, the company reports.

Mr. Bainton's idea for a gravity conveyor system for example, brought about a re-survey of the whole system of work-flow. Reductions in inventory and process time were considered where otherwise they might have been overlooked.

Upsurge in Morale—Says Henry D. Sharpe, Jr., the firm's president: "We have found with our experiment that there is real feeling of 'something drastic being done' to get the company ahead. This feeling is reflected in the teamwork everyone shows on the job."

Mr. Bainton, by the way, has followed in the footsteps of his father, Arthur H. Bainton, who recently retired as works manager.

how to rustproof cold rolled steel in shipment and storage



Proved by actual test! Unwrapped steel rusted within a few hours. Identical steel wrapped in Ferro-Pak showed no signs of rust . . . even after several months. Non-toxic chemical vapors from Ferro-Pak coat the steel with an invisible film that makes it impossible for rust to get the slightest foothold.

Even under adverse conditions, such as outside storing or shipping, Ferro-Pak provides complete protection. It is waterproof, strong, yet highly flexible and easy to handle. The chemical rust inhibitor is compatible with oil and stays effective for long periods even when the humidity soars.

Whether you're a shipper or a buyer of steel, it will pay you to specify Ferro-Pak wrapping wherever rust is a problem. For an interesting idea brochure on many uses for Ferro-Pak, write Cromwell Paper Company, 4803 South Whipple Street, Chicago 32, Illinois.

How to rustproof a freight car—Ferro-Pak is used to line sides of car and to interleave coils, transforming ordinary freight car into huge rustproof package.

How to rustproof black plate—On this light gauge, dry, uncoated steel, rust can start from a fingerprint. Ferro-Pak keeps black plate rust-free even when the humidity soars!

FERRO-PAK®

by Cromwell

For over 38 years—
"Paper Engineers" for Steel

How Vital Are Population Trends?

Makeup of the national population is getting more attention as a business factor.

But income is still important in short term trends. Failure of income to continue its climb helped nip confidence.

■ "I'll take income before all these demographic factors any time," a prominent Dept. of Commerce official states emphatically.

By demographic factors he means, of course, the economic effects of population and its changes. Included are projections of family makeup, age, and many other aspects of the population of the country.

More and more, economists are studying the breakdown of the population and its changes. They apply the results as an explanation of current business trends and the basis of forecasts.

Population vs. Income—The fact that there are more older children in the family, for example, is getting some blame for the lag in consumer durables. (See Special Report, P. 51.) The theory is that with older children, emphasis is away from washing machines to setting aside money for education, cash for clothes, etc.

Others, while giving the population economists varying degrees of credit, put the emphasis on income as the dominant economic factor. In your business, you probably should keep an open mind to both.

Income Acts Fast — In actual practice, income has the greater effect on the short-term trends. Population trends are of long-term nature. Furthermore, there is no evidence that one age group of any given generation is going to make the same demands as another.

At the moment, there isn't any particular conflict. But, generally, those who keep a close eye on income are on the verge of pushing the panic button.

Look to the 60's—In contrast, those who rely on population trends tend to gaze serenely over the present situation as a temporary evil and refer to the golden sixties. Then, prosperity and production are expected to be unlimited, thriving on the expanding population.

. . . Many Purchases Deferred

Individual Takes Precedence—Income, however, is a more urgent factor. Without continued high income, there will be no spending boom at the individual level.

With the capital goods boom on the shelf for another five to ten years, spending for personal use will have a greater impact on the economy than in recent years.

That's why there is more concern in some areas than is represented at the official spokesman level. And this applies to business as well as government.

No Gain Since '56—Even in the recent boom years, there was no significant increase in "real income" since the last quarter of 1956. It has been in a decline in recent months.

Income has stayed high, but spending for certain types of consumer goods has dropped off. Savings also stayed high, one of the few bright spots in the economy.

Buying Deferred—But the general public has stayed away from making "easily deferred" purchases. That includes cars, stoves, refrigerators, furniture, and many other major investments.

There are many plus factors still working in the economy. But it's significant that factory shipments of many major products are currently lagging behind replacement.

The consumer's dollar, which has not grown, is being squeezed in a different way these days. More is going into doctor bills, insurance policies, services that have suddenly become necessary. Less is now available for those deferrable purchases. It's not an easy problem.

Bad Weather A Business Factor

Don't discount the weather as a business factor this year. In many areas of the country, big intervals of February and March were virtually wiped.

Severe weather in February was responsible for the lag in housing starts. Rebounding, expected in March, was probably delayed again by tremendous storms in the East.

For the same reason, retail sales in these periods suffered greatly, as transportation was slowed, halted, or just inconvenienced. It's impossible to guess how many major purchases have been deferred.

It's an old story in the auto industry, where bad spring seasons always caught the brunt of poor sales. But this year, many businesses have seen long weeks of poor sales and a lot of the discouraging business is directly attributable to poor weather.

AUTOMOTIVE

New Ford Vehicle Rides on Air

It Skims Along Ground Without Aid of Wheels

Scientists believe this new principle in transportation has an important future.

Advantages are reduced power-weight ratios and tremendous speed potential.—By H. R. Neal.

▪ Ford Motor Co. is experimenting with a wheel-less vehicle that may some day become a major form of high-speed land travel. The scooter-like device, called the "Glideair" by Ford scientists, rides on a thin film of air just a fraction of an inch above the roadbed.

A working, riding model of the vehicle was demonstrated in a corridor at the company's Engineering and Research Center, Dearborn, Mich.

Its Operation — Andrew A. Kucher, Ford vice president, engineering and research, explains that wheels are replaced by "levapads" on the Glideair. Tiny jets of air stream through holes in the levapades, supporting the vehicle. This method of suspension, says Mr. Kucher, is called "levitation."

The idea isn't new. As early as 1928 Mr. Kucher advanced the theory that vehicles could slide at high speeds using air as a lubricant. But this is the first time the theory has been reduced to a working principle.

GLIDEAIR MAKES DEBUT: Standing by a model of the "Glideair," a wheel-less vehicle that travels on a thin film of air, is A. A. Kucher, Ford vice president who developed it. Scooter in background proved his theory.

Theory Proved—Ford's working model still isn't much more than a 3-ft triangular platform with a seat and handlebar for balancing. But Ford believes it may be the forerunner of land travel from Detroit to Chicago in less than an hour.

Like the Wright brothers' first airplane, it establishes the practicality of the venture. Hoses, trailing from the levapads and connected to the laboratory's compressed air system, supply sufficient force to lift a 300 lb load and send it scooting along.

No Road Friction—In the demonstration, the trailing tubing, available air pressure, and length of the corridor "proving ground" prevented speeding.

Ford scientists see this as only the beginning. Senior Development Engineer David J. Day said speeds of from 200 to 500 mph can easily be attained in Glideair vehicles. Reason? No road friction to overcome—just wind resistance.

Possible Power Sources—In all likelihood, Mr. Jay said, the vehicles would travel "on" rails, either similar to those currently used by trains or an overhead monorail system. Power will come from either gas turbines or turbojet engines. Elaborating on this point, he said calculations show only about 50 hp needed to levitate one ton of vehicle weight. It will take only about 40 hp more to move it 100 mph.

Of course, as speed increases so does the power requirement. Mr. Jay estimated it would take about 800 hp to travel 400 mph, a figure

Missing Something?

The Answer is Pink!

Switch to PINK CIMCOOL

Yes, if you're missing that extra something in *your* shop, try CIMCOOL for metal cutting jobs. The famous CIMCOOL® family of cutting fluids covers every job, every type of work and metal. Discover how the famous pink cutting fluid can lower costs and increase production in your plant.

Here are three reasons why CIMCOOL has become the largest selling chemical cutting fluid in the world:

CIMCOOL LOWERS COSTS because it's longer lasting in machines. Therefore, it reduces downtime and cuts labor costs for cleaning and changing.

CIMCOOL PERMITS FASTER SPEEDS and feeds, because of its chemical lubricity. It combines friction reduction and cooling capacity in a degree never before attained by old fashioned lubricants.

CIMCOOL IS CLEANER TO USE because it doesn't soil hands or clothing. It contains no skin irritants. And it's safer because it leaves no slippery film on shoes, floor, machine or work. It can't smoke, can't burn, and virtually eliminates rancidity and foul odors.

So don't keep things *under* your hat . . . call your CIMCOOL Distributor today. He'll be glad to give you full information on all the advantages of CIMCOOL Concentrate—as well as details on the entire family of CIMCOOL Cutting Fluids. YOU may be missing something!

Or contact us direct and we'll have one of our Cincinnati Milling trained machinists call on you—without cost or obligation, of course. Write, wire or telephone, Sales Manager, Cincinnati Milling Products Division, Cincinnati 9, Ohio.

CIMCOOL CUTTING FLUIDS

CIMCOOL S2 Concentrate—The famous pink fluid which still covers 85% of all metal cutting jobs. Effective, economical and clean.

CIMPLUS—The transparent grinding fluid with exceptional rust control. Also used for machining cast iron and as a water conditioner with CIMCOOL Concentrate.

CIMCUT Concentrates (AA, NC, S5)—For jobs requiring oil-base cutting fluids. Added to mineral oils, they give economical mixes for higher speeds and feeds.

CIMCOOL Tapping Compound—Permits the use of highest tapping speeds and increases tap life amazingly.

Also, CIMCOOL Bactericide and CIMCOOL Machine Cleaner.

for 100% of all metal cutting jobs. The Answer is Pink!

Production-proved products of The Cincinnati Milling Machine Co.

® Trade Mark Reg. U.S. Pat. Off.

time saved is . . . money earned

BULLARD

The application of Bullard Mau-Au-Trol Vertical Turret Lathes, Model 75, to the machining of aircraft turbine compressor cases clearly demonstrates the superiority of automatic operation.

According to Mr. George E. Saupe, Chief Manufacturing Engineer at Solar Aircraft Co., San Diego, California, these are some of the advantages:

1 Spoilage practically eliminated.

2 Machining time reduced from 14 hours to 1 hour and 42 minutes per unit.

3 In process inspection unnecessary.

4 Better production control.

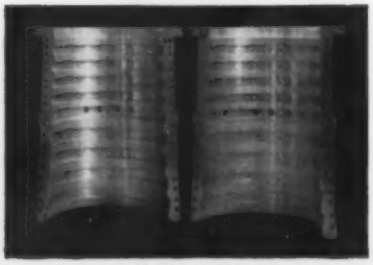
5 Reduces error of the operator.

6 Less work in process inventory.

A call, to your nearest Bullard Sales Office or Distributor, can be your first step toward time saved and money earned with your machining problems.

SOLAR JUPITER COMPRESSOR CASE

ROUGH PIECE



FINISHED PIECE

THE BULLARD COMPANY
BRIDGEPORT 9, CONNECTICUT

Automotive Production

WEEK ENDING	CARS	TRUCKS
March 29, 1958	92,482	17,701
March 22, 1958	80,560	15,797
March 30, 1957	130,233	22,479
March 23, 1957	138,646	23,219
TO DATE 1958	1,226,800	224,500
TO DATE 1957	1,791,600	278,400

*Preliminary Source: Ward's Reports

he termed extremely small. For example, he explained, a low-speed turbojet engine developing 1000 lb thrust would only be about four or five feet long and 18 in. in diameter. One horsepower equals one point thrust—at 375 mph, he said.

Power-Weight Ratio — Mr. Jay also pointed out another factor relating to power requirements. "The fascinating part of the Glideair project is that additional power is needed only to levitate the vehicle," he said. "As an example, assume that we have two vehicles, one weighing one ton and the other 50 tons. If both offer the same frontal area to wind friction it would require only slightly more power to drive the far heavier one at the same speed."

He compared a modern, four-engine passenger plane with a take-off weight of 100,000 lbs and a Glideair vehicle of the same weight. The plane's four 2400 hp engines deliver 9600 hp total. Glideair would need only 2500 hp to levitate it (50 hp per ton), and about 1800 hp more to drive it 400 mph —less than half the power requirement of the aircraft.

More of Glideair's total weight would go into payload, too, Mr. Jay said, as the vehicle isn't concerned about wings or heavy control tails that make up about 60 pct of the drag of an airplane.

The Wheel's Fate—Having covered What? and How?, When? and Where? become important questions. Mr. Kucher was purposely vague in drawing up a timetable of Glideair development, but said he "foresees the day when the wheel will have reached its top speed capabilities."

"We look upon the Glideair as a new form of high-speed land transportation, probably in the field of rail surface travel, for fast trips of distances of up to about 1000 miles," he said. He revealed levapads have been designed to fit around a standard rail.

Braking Is Easy — Electronic sensing and control systems would be used to control Glideair vehicles because human reaction times are too slow to cope with speeds involved. Braking would be a simple matter of reversing engine thrust, using water scoops or mechanical or magnetic brakes, as Mr. Kucher sees the ultimate system.

Despite Glideair's potential, the Ford vice president doesn't see the end of the wheel for car and truck transportation tasks. Also, he doesn't see automobiles ever approaching speeds that would make the wheel obsolete for this type of vehicle use.

Speeds of about 200 mph can be considered the practical maximum for wheeled vehicles with either tires or steel wheels, he said. Vibration, loss of traction and loss of control were cited as some of the limiting factors in high-speed wheels.

Chrysler Expands Air Conditioning Setup

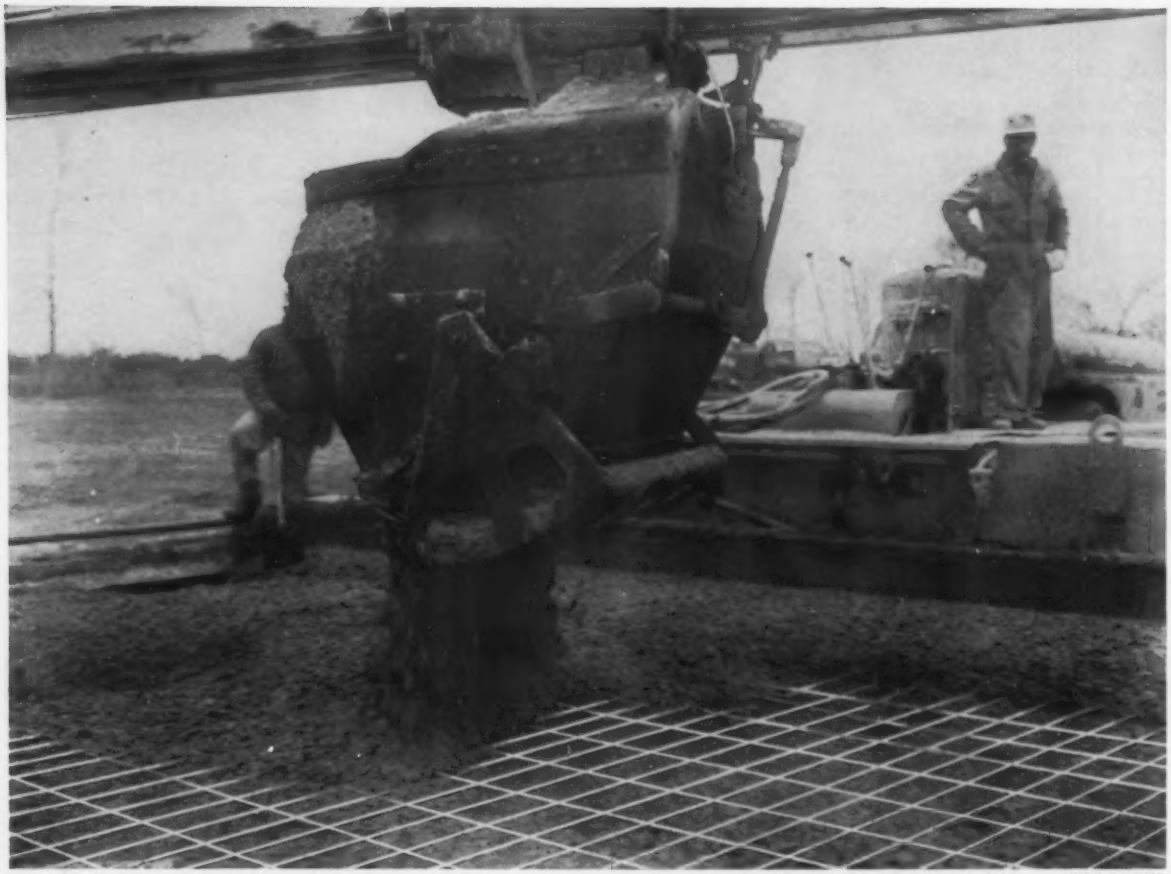
Chrysler division has set up an integrated assembly-line air conditioning system and is stepping up training of personnel to cope with the growing demand for automobile air conditioning.

The new installation method permits personnel specialization and use of the most modern equipment for drying, metering, charging and testing automobile air conditioning units. Chrysler now offers three different air conditioning installations.

Clare E. Briggs, division sales vice president, said one in every three Imperials and one in every 10 Chryslers currently are built with air conditioning units. He disclosed that the division's air conditioning installations rose 98 pct in 1957 over the 1956 model year.

THE BULL OF THE WOODS

OL' GRAVY IS OFF AN' THEY PUT ME ON THIS DRUM FOR TH' BIGGEST CRANE IN TH' WORLD! BOY, THAT'S SUMP'N, WORKIN' ON TH' BIGGEST CRANE EVER BUILT!
WELL, WHAT DO YOU WANT--THREE CHEERS? I'VE HELPED TO BUILD TH' BIGGEST MACHINERY EVER PRODUCED AN' FELT HONORED IF TH' BOSS SMILED WHEN HE SAID GOOD MORNIN'!
HE GETS THEM SOUR SPELLS WHEN HE SEES ALL TH' MAGAZINE AND PAPER STORIES OF GUYS MAKIN' A HOLE IN ONE, A HOME RUN, OR A TOUCH-DOWN!
THE LIMITED GLORY



ROAD PAVER AT WORK ON DETROIT-TOLEDO EXPRESSWAY. CONTRACTOR: DENTON CONSTRUCTION CO., DETROIT, MICH. DSC PHOTO

DSC Electro-Welded Wire Fabric Makes Concrete Crack Resistant

WHAT IT IS—DSC Fabric is a money-saving means of supplying the needed tensile strength which concrete commonly lacks. That explains its engineering function in the building of roads and structures and in fabricating concrete pipe and other precast concrete products.

Portsmouth mesh consists of DSC Bright Basic L. C. Reinforcing Wire. The wire intersections are electrically welded to produce a continuous lattice-work mat.

DSC Fabric conforms to ASTM Specification A-185-56T—PROOF of PERFORMANCE of DSC STEEL . . . on the job.

HOW IT SERVES THE PUBLIC—DSC Fabric promotes easier, smoother, faster and *safer* highway driving; saves tax money by reducing initial and maintenance costs of public roads, structures, sewerage and general drainage systems; protects buildings against cracks, leaks, vermin.

For more information on DSC Fabric and its uses . . . or about other DSC Rod and Wire Products . . . or DSC Sheet and Strip Steel—please write DSC General Sales Office or call your nearest DSC Customer "Rep" . . . today?

Customer Satisfaction Is Our Business

DSC MILLS AND PRODUCTS

PORTSMOUTH DIVISION, PORTSMOUTH, O.

Coke • Coal Chemicals • Pig Iron
Basic OH Steel Ingots • Blooms • Slabs • Billets • Rods
Hot Rolled and Cold Rolled Sheets • Low and Medium Carbon
Manufacturers' Wire • High Carbon Specialty Wire • Aluminum Cable Strand
Reinforcement • Rope Wire • Tire Bead Wire • Welded Wire Fabric

MILL DIVISION: DETROIT, MICH., HAMDEN, CONN.

Cold Rolled Carbon Steel Strip
Flat Cold Rolled Carbon Spring Steel

DSC 35TH ANNIVERSARY YEAR

DETROIT STEEL CORPORATION

GENERAL SALES OFFICE, DETROIT 9, MICHIGAN

CUSTOMER "REP" OFFICES:

Charlotte, N. C., Chicago, Cincinnati, Cleveland, Columbus, Ohio., Dayton, Ohio., Detroit, Grand Rapids, Mich., Hamden (New Haven), Conn., Indianapolis, Jackson, Mich., Louisville, Ky., Milwaukee, Wis., New York, St. Louis, Toledo, Worcester, Mass., Winneconne, Wis.

COPYRIGHT 1958

Tax Cuts Rest on Public Opinion

Congress Won't Act Without Voters' Go-Ahead

Although most of Ike's advisors are now convinced a tax cut is necessary, action won't come immediately.

Congress will use spring recess to get the grass roots feeling.—By G. H. Baker.

▪ In the next two or three weeks we'll find out if Congress and the White House are serious about cutting taxes this year.

Right now, the political leaders are busy taking the pulse of the national economy. Before voting any tax cuts this year, they want to be sure the reductions are essential —and that there's real demand for them.

The Timetable — Way it looks now, a decision on whether or not to cut taxes will be made in late April. Here's the timetable for the next three weeks: At the White House, almost every member of President Eisenhower's official staff now believes tax reduction is essential this year.

But the staff hasn't yet presented this view to Mr. Eisenhower. They know he'll demand the latest figures on industrial production, sales, and employment to substantiate the case for tax cuts. So they plan to wait for the early April figures on economic activity before going to the boss with their tax-cut plans.

Take Public Pulse—At the other end of Pennsylvania Avenue, the Congress is taking its Easter recess from April 3 until the 15th. During this period, every lawmaker worth his salt will travel around in his own constituency as part of the annual spring mending of political fences.

They'll sound out the voters—businessmen, consumers, wage-earners—to learn how serious folks are about the need for tax reduction. If they sense that the voters are determined to have tax reduction this year, it's a cinch they'll hurry back to Washington to get busy on the necessary legislation.

A growing list of both Democrats and Republicans plans to propose "something for everybody" tax-cut bills, including across-the-board cuts in the rates applying to individual income, removal of the federal excises on freight, and removal or halving of the 10 per cent excise on new passenger automobiles.

Defense Spending Spree Launched

Congress is moving dangerously close to a wide-open defense spending spree. In their haste to get new federal money into circulation at local levels, congressmen of both parties are approving orders for the Pentagon to start some military projects of little or no strategic value.

Usually, the Pentagon does not protest any orders from the Congress to spend more money. But some of the wild new spending authorizations emerging from Congress these days are of such questionable merit as to cause grave concern among top military men. Some Pentagon officials are saying in private that the present wave of uncontrolled military spending may be just as harmful as last year's cutbacks in spending authorizations.

The Defense Department is now spending for procurement at the rate of about $1.2 billion a month. This rate has been rising rapidly in recent weeks.

Little Hope for Defense Streamlining

Not This Year—Plans for compressing the unshapely bulk of the U. S. military structure will produce no startling results this year.

Proposals are plentiful and Defense Secretary Neil McElroy was to offer his own plan to the Senate this week.

But considered recommendations for a reshaped framework in the Pentagon run up against this unpleasant fact: It's a great deal tougher to unbuild an expanded agency than to put it up initially.

Wants More—In fact, the Secretary reportedly was ready to ask Congress for authority to increase his staff, probably with a bid for specialists and advisors.

House and Senate measures are designed to shrink, not expand the office of the Defense Secretary. It now contains some 2400 civilian employees.

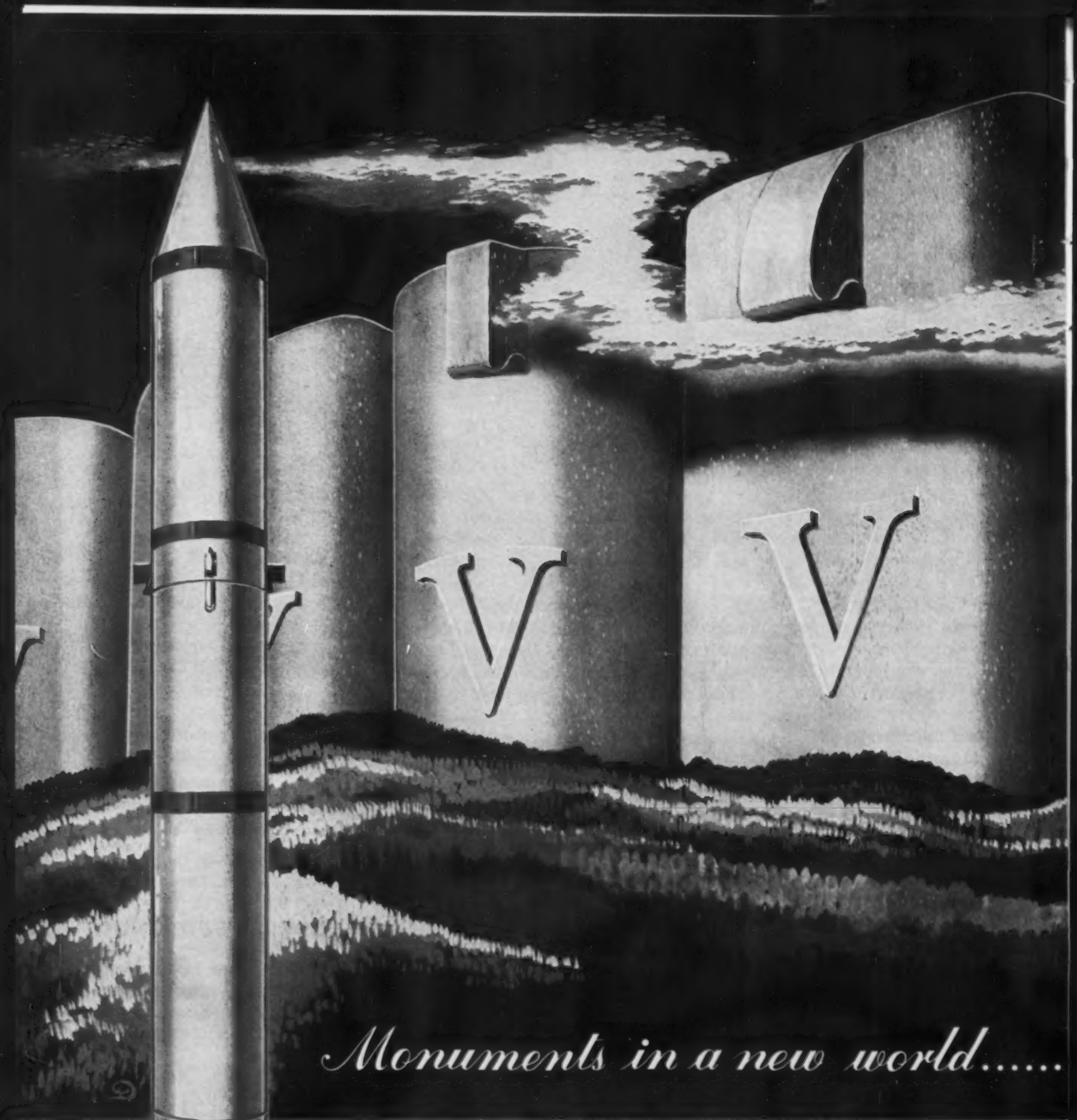
Bills introduced call for:

Bill Provisions — Limiting the peacetime tour of a JCS member to three years.

Permit the Joint Chiefs to set geographic boundaries for unified commands.

Trim the number of under secretaries and assistant secretaries. Now up to nearly 30, number could be cut to 15.

Cut down the influence of the Defense Dept. comptroller in determining military programs.



Monuments in a new world.....

Valley ingot moulds are designed for individual steel plant conditions. These moulds meet today's metallurgical requirements

VALLEY MOULD AND IRON CORPORATION

GENERAL OFFICES: HUBBARD, OHIO

Western Office: Chicago, Illinois. Northern Office: Cleveland, Ohio

Alaska Boosts Economic Activity

Area's development plans will affect Canada and eleven states in western U. S.

New road, replacing Alcan Highway, would improve flow of commerce.—By R. R. Kay.

▪ Industrial planning goes on in Alaska while the area's move for statehood is considered.

Economic developments in the territory will have far-reaching economic effects in Canada and the eleven western states.

Right now feverish oil-searching is under way. Alaskan officials are swamped with applications for leases on 13 million acres. So far, they've cleared over a million.

Exploration Welcomed — Richfield Oil Corp. has a producing well on the Kenai Peninsula, south of Anchorage. Standard Oil of California is putting $30 million into its Alaska operations. And 30 other oil companies are swarming in the region.

Still more activity will come from Interior Secretary Seaton's plan: To open for exploration 20 million acres north of the Arctic Circle. The area is next to the vast Naval Petroleum Reserve just south of Point Barrow and near a proved natural-gas pool field called the Gubik.

New Road Discussed—There's talk of a new road through Canada to Alaska. It could help to make accessible the Far North's economic treasure. The route would be through British Columbia and the Yukon area into Alaska's heartland. The Alaska International Rail and Highway Commission is talking about it.

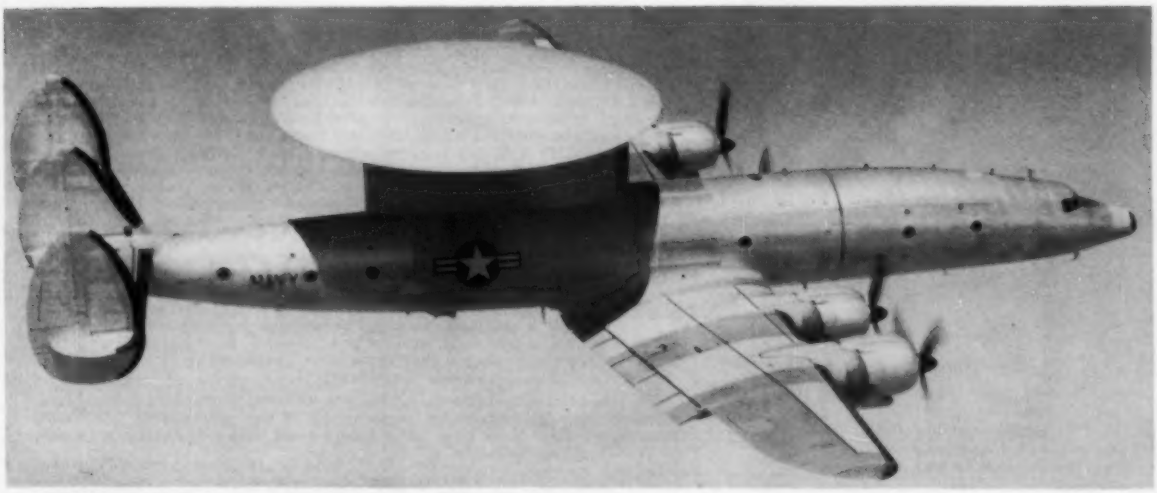
The new road would replace the tricky Alcan Highway which now serves the region. It would be closer to the coast, with access roads leading to port cities. These cities are now cut off, except by boat, from other locations within the region. The new highway would stimulate the flow of commerce and help attract new population and industries.

Power Plants Coming — A $6 million steam-electric plant to go up in the Nenana coal fields, 100 miles south of Fairbanks, is another development. The Golden Valley Electric Assn. will build it to meet an expected upsurge in Fairbanks' power needs.

And the city of Sitka has an application in with the Federal Power Commission for a $5 million power project. The city needs it to serve domestic, commercial, and industrial users.

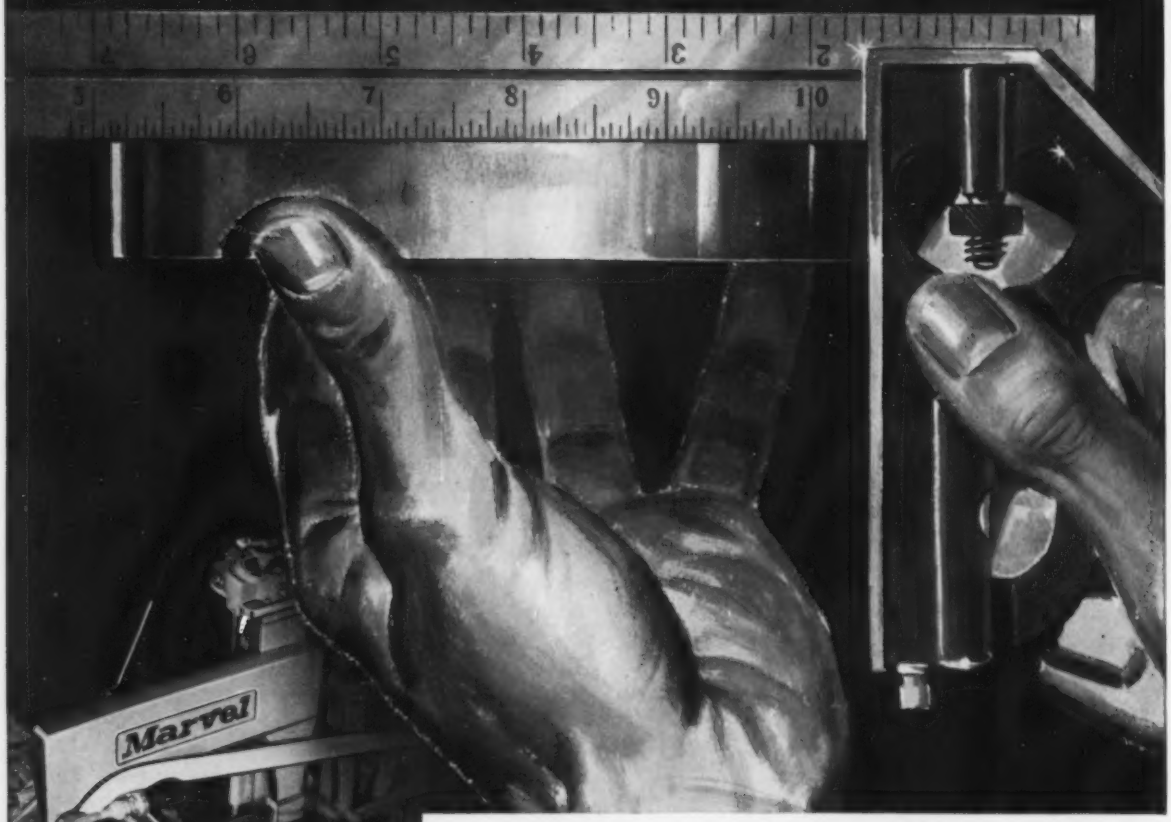
It all adds up to significant stirrings in the territory.

What the Well-Dressed Aerial Sentry Wears



PIGGY-BACK FLYING SAUCER? Actually this strange flying shape is a part of U. S. defense force. It's a Navy research plane built by Lockheed which carries the best known radar equipment. Large radome houses antenna for super-vision electronic eye capable of doing the work of dozens of ground radar stations.

IN CUTTING-OFF OPERATIONS...



...SPEED WITHOUT ACCURACY
IS COSTLY!

Efficient cut-off of steel blanks from bars demands a combination of speed *and accuracy*. MARVEL, and MARVEL alone, achieves this combination with machines capable of delivering feeds and speeds which fully utilize the strength and heat resistance of the modern high speed hack saw blade.

MARVEL dual power feed and crank lever method of reciprocation are two exclusive features designed to give increased speed and efficiency. This unique dual power feed employed on the Series No. 6 and No. 9 MARVEL Ball Bearing Hack Saw Machines, simultaneously controls both positive feed depth and feed pressure, automatically adjusting both pressure and depth of feed correctly in proportion to the number of teeth in contact with the work. This automatically forces the blade to cut as deeply as possible and practical on every stroke, without demanding the attention of the operator. As a result, the work is cut-off in the fewest possible number of strokes. Quick return of the saw frame on the non-cutting stroke, accomplished by the crank lever, delivers 33⅓% more cutting strokes per minute without increasing the blade velocity on the cutting stroke.

Accuracy is assured by the construction of the machine itself. Anti-friction ball or roller bearings are used at all load carrying points. The saw frame reciprocates on fully enclosed special design ball bearings which are factory adjusted with a pre-load, assuring permanent frictionless rigidity. Saw frame, saddle, and upright are precision machined and fitted to form a rigid integral unit capable of withstanding any cutting load with no deflection or side movement.

These exclusive features found only in MARVEL Hack Saw Machines, together with the unequalled performance of the unbreakable MARVEL High-Speed-Edge Hack Saw Blade, form a team that guarantees the fastest, most accurate cutting-off.

S-1300

There is a MARVEL field engineer near you capable of intelligently discussing your cut-off work. Send for catalog C-55, and the name and address of your nearest MARVEL field engineer.

ARMSTRONG-BLUM MFG. CO.
5700 WEST BLOOMINGDALE AVE. • CHICAGO 39, ILL.

Metal Cutting MARVEL SAWS
Better Machines—Better Blades

New Plans for Military Tooling

Revolving Fund Asked for Armed Services

Programs are aimed at aiding national defense and bolstering the machine tool business at the same time.

Meanwhile, January orders show improvement for cutting tools.—By E. J. Egan, Jr.

▪ For one reason or another, the military services don't always spend all the money they budget in a fiscal year to buy new machine tools. On June 30 each year, any leftover sums go back to the Treasury.

It's commendable when the Army, Navy and Air Force buy tools with an eye toward their usefulness, regardless of fiscal-year deadlines. But it's a pity they can't hang on to unexpended sums—to have the money on tap when they need new tools.

Up To Congress—Legislation to set up just such a fund is pending in both branches of Congress. One such bill is S. 2595, which Senators Sparkman and Thye dumped into the hopper last July. It's had a couple of preliminary readings but hasn't been passed as yet.

S. 2595 provides that "working capital funds . . . may be charged with the cost of machine tools and other durable productive equipment."

Major Points—It also provides that such funds may be reimbursed in three ways: (1) With machine-tool rental fees received from Government contractors; (2) with price concessions on military-contract items received in lieu of rental fees; (3) with charges allowed for depreciation or obsolescence of Government-owned equipment.

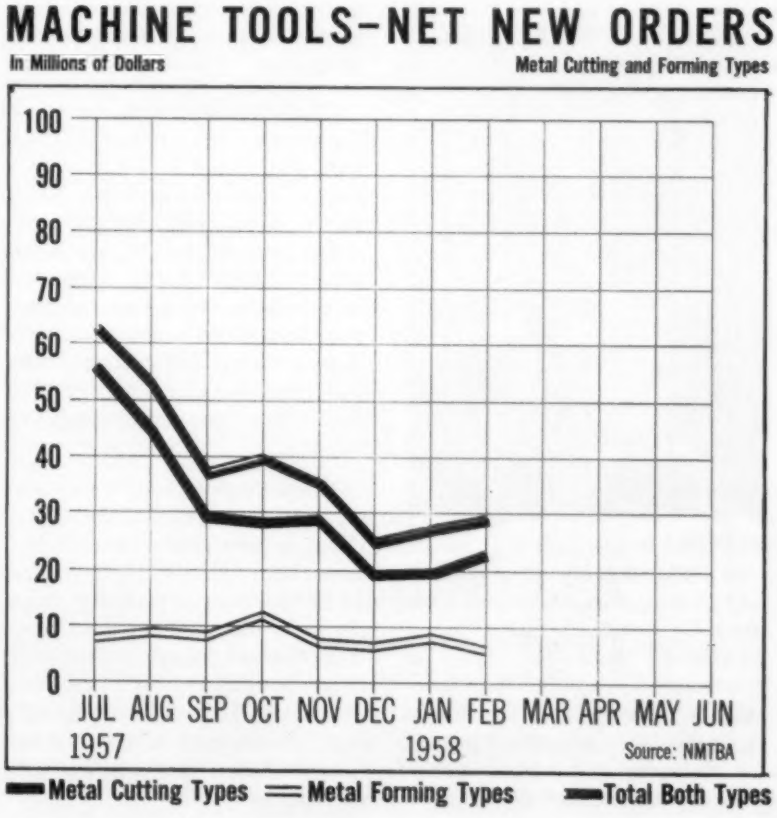
A similar bill was introduced into the House in February. Its sponsor, Representative Reuss, D., Wis. Congressman Reuss says that the measure, if enacted, "will contribute not only to the national defense but will give substantial aid to the hard pressed machine tool industry."

Orders Improve—Congressional approval of the revolving fund idea would be a boon to U. S. machine tool builders, even though their "hard pressed" industry may already be crawling out from under the flattening effect of the recession.

Reporting on February business volume, the National Machine Tool Builders' Assn. says that new orders for metal cutting tools totaled $22.9 million, 18 pct higher than January, $19.3 million.

Good and Bad—New orders for metal forming equipment didn't show the same pattern, though. They added up to only $5.5 million in February, compared to the January total of $7.6 million.

But even with the drop in purchases of forming machinery, net new orders for the combined total hit $28.3 million in February. This was 5 pct better than the January tally of $26.9 million for both types, and well above the December, 1957, figure of $24.9 million.



INDUSTRIAL BRIEFS

Action at P&R—Shuron Optical Co. has become a subsidiary of Philadelpha & Reading Corp., Geeva, N. Y. Assets of the optical company had been purchased for about $4.5 million. Earnings of Shuron Optical over the past several years have averaged about $500,000 on an average annual sales volume of $15 million. Purchase of Shuron Optical represents the third major acquisition by Philadelphia & Reading Corp. since the present management took office some two years ago.

Southern Trend—The U. S. Steel Supply Div., U. S. Steel Corp., has launched a steel warehousing operation in Birmingham, Ala. The division will utilize the former strapping products warehouse of Gerrard Steel Strapping and the former wire rope and stainless steel warehouse of U. S. Steel's Tennessee Coal & Iron Div. Gerrard, formerly a separate division of U. S. Steel, recently became a part of the supply division.

HONORED: Dr. Robert C. Swain, vice president in charge of research and development, American Cynamid Co., received James Turner Morehead Medal for 1957 at International Acetylene Assn. convention. Award was for "leadership in developing a commercial process for melamine and related derivatives of calcium carbide."

Study of Stainless—A new 396-page book on the fabrication of stainless steel is now being distributed by Allegheny Ludlum Steel Corp. The book contains photographs, charts, graphs and special diagrams on the making of this versatile metal into usable products. A copy may be had by writing to the Advertising Dept., Allegheny Ludlum Steel Corp., Pittsburgh.

Progress at Porter—H. K. Porter Co.'s Vulcan Crucible Steel Div., will now be known as Vulcan-Kidd Steel Div. The Kidd Works, recently acquired by Porter, is located in Aliquippa, Pa., adjacent to the Vulcan Works. Kidd produces drill rod and custom cold-drawn special shapes. Vulcan produces carbon, alloy, and high speed steels.

Take a Breather—Buhr Machine Tool Co., Ann Arbor, Mich., has completed major plant expansion, increasing its production capacity by about 75 pct. The expansion consists of two main bays. One is devoted to heavy machining and the other to assembly of multiple-operation machines. Expansion involved an expenditure of approximately $1 million.

Rent - a - Lift - Truck — Clark Equipment Co.'s Industrial Truck Div. has purchased Lift Truck Rental Corp., New York. Clark Rental Corp., the formed subsidiary, will rent forklift trucks and other materials handling equipment in metropolitan New York, northern New Jersey and Connecticut. Purchase price was $2.3 million. Assets purchased include a fleet of 550 fork trucks and 30 maintenance vehicles.

Tough Containers—The Container Div., Jones & Laughlin Steel Corp., is now producing pails and drums with "Plastisol" linings used for the shipment of hard-to-package chemicals and food and drug products. Plastisol linings are made of finely powdered vinyl resins and plasticizers. These linings will withstand the chemical action of strong acids, alkalies, and aqueous salt solutions.

Active Reactor—A new research reactor operated by Union Carbide Corp. for the U. S. Atomic Energy Commission has been placed into operation. Designated the Oak Ridge Research Reactor, it is a high - flux, tank - type reactor immersed in a pool, a modification of the Materials Testing Reactor which was originated at Oak Ridge National Laboratory. It will be used for fundamental research and engineering studies on the effect of nuclear radiation on reactor materials, particularly fuel elements and structural materials.

More Missile Muscle—Two contracts have been awarded for the production of Nike Hercules missiles and ground equipment. The contracts, placed with the Western Electric Co. as prime contractor, total $129,592,706.00. The Hercules missiles and ground equipment will be produced at Western Electric's plants in Winston-Salem, Greensboro, and Burlington, N. C., and the Charlotte, N. C., Ordnance Missile Plant. The latter is operated for Army Ordnance by the Douglas Aircraft Corp.

Shingle Is Up—A new firm of industrial engineers and consultants has been established to be known as the Indecon Corp. It brings together consultants and specialists in industrial design, steel mill engineering and construction. The main office of Indecon Corp. is located in Kansas City, with branch offices in Detroit, Cleveland, and Hammond, Ind.

Importing Ideas — Chromalloy Corp., White Plains, N. Y., has acquired from Metallic Surfaces Research Laboratories Ltd., of England, the exclusive rights for the U. S. and Canada to import new metallic diffusion process and techniques and to U. S. patents for which applications will be made. The processes and techniques will enable the company to enlarge its field of activity to include gaseous diffusion of beryllium, silicon, aluminum and other elements.

2,000,000 DEFLECTIONS WITHOUT FAILURE.....Severe fatigue tests show Duraflex,® Anaconda superfine-grain Phosphor Bronze, permits far higher design stress

LICENSED PROFESSIONAL ENGINEERS, MEMBERS AMERICAN SOCIETY FOR TESTING MATERIALS, AMERICAN SOCIETY OF MECHANICAL ENGINEERS, NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

CONSULTING ENGINEERS — THE CARLSON COMPANY — MACHINE DESIGNERS

3457 WEIDNER AVE.
OCEANSIDE, L. I., N. Y.
TELEPHONE RO 4-8181

Complete engineering and manufacturing services including design and development of special machinery, mechanical products and power actuated mechanisms. Stress analysis, spring design, metallurgical data, heat treatment, plant layout, engineering reports, selection of materials and equipment. Tools and products.

The American Brass Company,
99 Park Avenue,
New York 16, New York.

October 25, 1957.

Gentlemen, SUMMARY OF ENGINEERING LABORATORY REPORT NO. 102557

SUBJECT: Fatigue Life Test of "Duraflex", Superfine-Grain Phosphor Bronze and Commercial Quality Grade A Phosphor Bronze spring wire.

SPECIMENS: Compression springs made from each material, were coiled on arbors to avoid tool marks. The springs had squared ends, a high pitch to obtain high stresses and were heated after coiling in boiling water for 1 hour to relieve residual coiling stresses.

CALIBRATIONS: Each spring had its physical dimensions measured with micrometers and vernier calipers and was load tested in a Comaco Elasticometer Precision Spring Testing Instrument, before fatigue testing and after each 100,000 cycles of deflection to determine loss of load, if any.

FATIGUE TESTING: A representative number of springs from each material were tested simultaneously under identical conditions.

STRESSES: The stress in the springs, including curvature correction, during the tests were as follows:

Stress at Initial Installed Position	36,600 p.s.i.
Stress at Final Deflected Position	73,200 p.s.i.
Stress Range during deflection	36,600 p.s.i.

These stresses, for endurance limit testing, are exceptionally high for phosphor bronze spring wire - far higher than those ordinarily recommended for Beryllium-Copper or Stainless Steel for such severe service and are comparable to those used for good quality Spring Steel.

RESULTS: Grade A Springs broke at average deflections of 505,700.

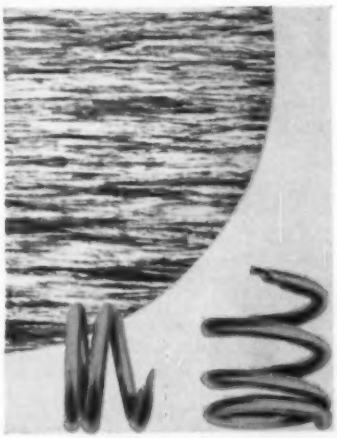
Duraflex Springs were still satisfactory with no appreciable loss of load at 2,000,000 deflections.

CONCLUSIONS: 1. Design stresses for Duraflex can be at least 33% higher than those used for Grade A Phosphor Bronze and as high if not higher than design stresses recommended for Beryllium Copper.

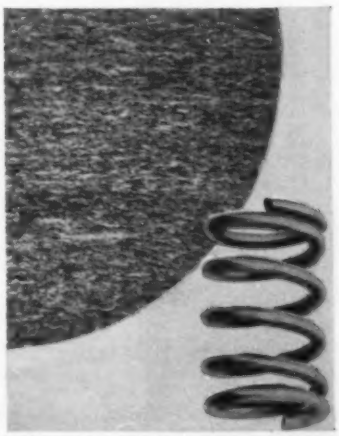
2. High endurance and long fatigue life at high stresses can be expected from springs made of Duraflex Phosphor Bronze.

CERTIFICATION: We certify the above summary of our report is accurate, in accordance with the facts and is true in every respect.

Respectfully submitted,
THE CARLSON COMPANY
Harold C. H. Carlson
Harold C. H. Carlson, P.E.
Licensed Professional Engineer.



Spring of Alloy A Phosphor Bronze, shown actual size, which broke just after 500,000 deflections. Micrograph (75x) shows typical grain structure of this metal.



Spring of Duraflex showed no appreciable loss of load after 2,000,000 deflections in same test. Micrograph (75x) shows typical superfine-grain structure of Duraflex.

Duraflex is a registered trade-mark for a higher quality phosphor bronze in sheet and wire forms, recently developed by American Brass Company research. Yet it costs no more than regular phosphor bronze. For detailed information—for a copy of the test data—write The American Brass Company, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Ltd., New Toronto, Ont. 5845

DURAFLEX
Superfine-Grain Phosphor Bronze
A product of
ANACONDA®
Made by The American Brass Company

QUAKER STATE
Constantly growing to meet your every Aluminum need
The sign of the Quaker State Aluminum Giant is becoming more and more familiar with more and more users of quality Aluminum. In practically every field... building supplies, sporting goods, appliances, furniture, toys. Wherever Aluminum is used, the call is to Quaker State®
THE REASON IS SERVICE
Quaker State's Mill is geared to handle your order on a personal basis. Regardless of the size of your order—large or small—you get fast, accurate, dependable delivery. Quaker State is versatile—whether you want coil, sheet or tubing, mill, embossed or anodized finish—you're sure to get it and in the gauges and widths you need.
11 Centrally Located Branch Offices to Cater to Your Needs
QUAKER STATE METALS COMPANY
Mill Producers of Aluminum Sheet—Coil—Tubing and Building Products in Mill, Embossed and Anodized Finishes
Lancaster, Penna.
Phone: Lancaster EXpress 4-5611
Branches Offices in
New York
Miami
Cleveland
Pittsburgh
St. Louis
Boston
Chicago
Philadelphia
Louisville
Detroit

Harry Carloss, elected executive vice president and **Rolland Webber,** named vice president, sales, The Deming Co., Salem, O.; **George Emeny,** elected vice president; **Walter Everett,** named asst. treasurer.

F. A. Kaufman, elected vice president, Universal - Cyclops Steel Corp., Bridgeville, Pa. and general manager, Refractomet Div.

F. A. Dudderar, appointed general superintendent, Clairton Works, U. S. Steel Corp.

H. S. Saxman, appointed vice president, finance, Latrobe Steel Co., Latrobe, Pa.

W. S. Moore, named vice president, Summer & Co., Columbus, O.

K. H. Meyer, elected vice president, C. B. Hunt & Son, Inc., Salem, O.

C. H. Johnson, appointed superintendent, Cleveland plant, Steel and Tubes Div., Republic Steel Corp.

E. N. Hibbert, appointed asst. general superintendent, Clairton Works, U. S. Steel Corp.

Ezra Garforth, Jr., elected vice president, sales, Steel Mill Div., Philadelphia Steel & Wire Corp., Philadelphia, **E. C. Mincher,** elected vice president, sales, Spring Washer Div.

R. J. Sund, elected vice president, American Can Co.

H. W. Whitman, elected vice president and general manager, Machine Div., The Torrington Mfg. Co.

L. T. DeLaup, appointed asst. to R. L. Jolley, president of Southwest Steel Products, an Armco Steel Corp. subsidiary.

C. W. Wesson, elected executive vice president and general manager, The Eastern Machine Screw Corp., New Haven, Conn.

J. E. Richards, elected secretary and corporate counsel, Universal-Cyclops Steel Corp., Bridgeville, Pa.

Stewart Monroe, appointed special representative, national accounts, Raybestos-Manhattan, Inc., Passaic, N. J.; **John McKinlay,** appointed manager, Northeast district.

W. N. Kiely, promoted to senior field sales engineer, midwestern area, NRC Equipment Corp., Chicago.

F. A. Royce, appointed division welding engineer, Steel and Tubes Div., Republic Steel Corp.

W. J. Schlapman, named sales manager, utility line, J. I. Case Co., Racine, Wis.; **W. H. Vogel,** named asst. sales manager, utility line.

V. H. Lanahan, appointed manager, ring sales, Heppenstall Co., Indianapolis; **C. B. Cobun,** appointed asst. to the director, sales.

C. B. Powell, named sales manager, Socket Div., Cleveland Cap Screw Co., Cleveland.

L. F. Black, named manager, Utah Operations, U. S. Steel's Co-

Tempilstiks°

THE CRAYONS THAT TELL TEMPERATURES

IT'S THIS SIMPLE

- Select appropriate TEMPILSTIK° for the working temperature you want.
- Mark your workpiece with it.
- The TEMPILSTIK° mark melts as soon as its temperature rating has been reached.

Accuracy within 1% of rated melting point.

Also available as TEMPILAQ° (liquid form) and TEMPIL° PELLETS

63 different temperature ratings available

For information and samples, send coupon

Tempil° CORPORATION
134 West 22nd St., New York 11, N.Y.
Send information on:

☐ TEMPILSTIK° ☐ TEMPILAQ° ☐ TEMPIL° PELLETS

☐ Send booklet "How Temperatures are Measured"

☐ Send sample pellets for _____°F temperature

Name_____
Address_____
City_____
State_____

Visit our booth #207 at the St. Louis Welding Show, April 15-17, 1958

lumbia-Geneva Steel Div. and manager, operations, Columbia Iron Mining Co.; **A. E. Terry,** named Geneva general superintendent; **C. J. Forkum,** promoted to asst. general superintendent.

G. G. Karian, appointed manager, iron powder sales, Alan Wood Steel Co., Conshohocken, Pa.

W. S. Wainright, appointed asst. district manager, Republic Steel Corp 's Houston, Tex., district sales office.

T. B. Peterson, promoted to district sales manager, Duff-Norton Co., Pittsburgh.

A. R. Deas, appointed manager, General Electric's Semiconductor Rectifier Mfg. Plant, Clyde, N. Y.

W. K. Colhoun, appointed manager, Wheeling Corrugating Co.'s Long Island City, New York Branch.

E. A. Holbrook named marketing manager, extrusion products, Kaiser Aluminum & Chemical Sales, Inc., Oakland, Calif.; **W. H. Grimm,** appointed product manager, extrusions, Chicago general sales office.

P. T. Babb, appointed district manager, sales, Sheffield Div., Armco Steel Corp., New Orleans, La.

E. E. Hirschberg, named sales manager, Industrial Combustion Div., Eclipse Fuel Engineering Co., Rockford, Ill.

A. P. Bowman, named manager, Milwaukee district office and **J. I. Onarheim,** named manager, utility sales, Milwaukee district, Allis-Chalmers Mfg. Co.

R. E. Casner, becomes vice president, sales, Townsend Div., Townsend Co., New Brighton, Pa.

N. J. Culp, promoted to supervisory metallurgist, alloy development, The Carpenter Steel Co., Reading, Pa.; **S. M. Purdy,** pro-

D

you can rely on

SERVICE

when you order

gray or alloyed iron

CASTINGS

from

DECATUR

Casting Co.

Decatur, Indiana

Phone 3-2700

Brainard Strapping

...WITH EXTRA BACKING

Brainard Steel Strapping has something extra to offer. As a division of Sharon Steel, Brainard Strapping is fabricated from steel that is quality controlled from mine to market. Sharonsteel, a buy-word among steel buyers, is your assurance of the finest steel strapping available when you buy from Brainard.

Sharon quality in Brainard Strapping is available in all standard sizes and gauges of tensional and heavy duty strapping.

SHARONSTEEL

Brainard Steel Strapping

SHARONSTEEL

Brainard Steel Division, Sharon Steel Corporation
Larchmont Avenue, Warren, Ohio

573

moted to supervisory metallurgist, metallography.

J. F. Ham, appointed product line manager, Safety Products Div., Mine Safety Appliances Co.

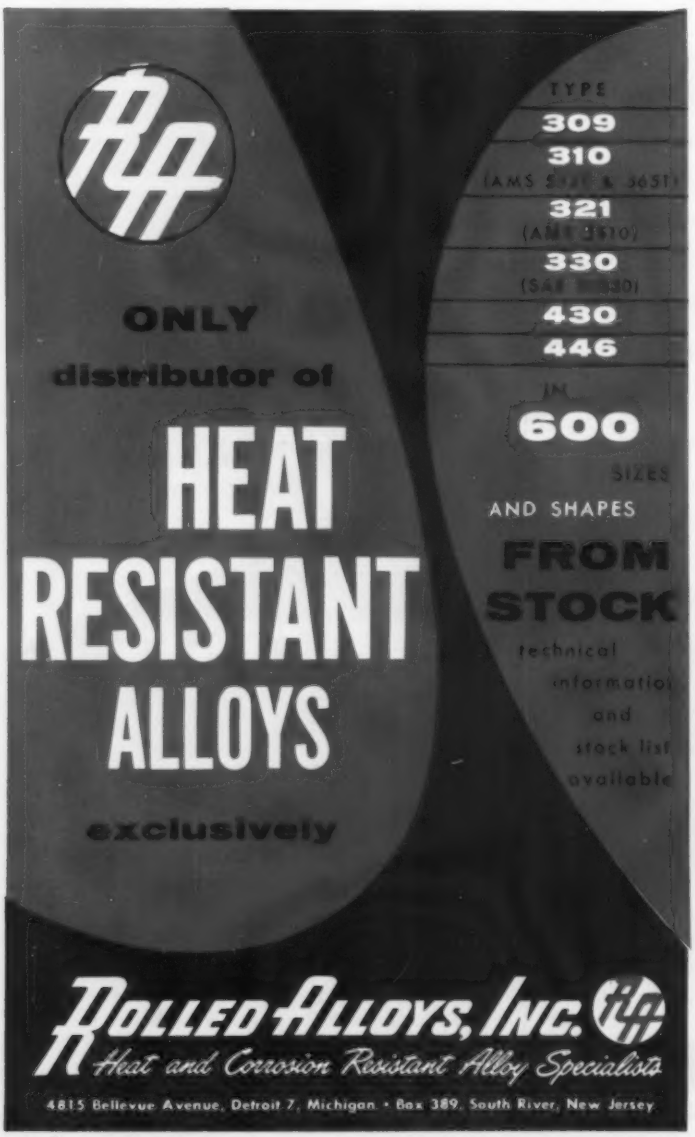
Phil Clarke, named manager, hot roll steel products, Lone Star Steel Co., Dallas, Tex.

F. W. Kayser, appointed merchandise manager, Industrial Products Div., Hewitt - Robins, Inc., Stamford, Conn.

W. N. McArdle, appointed sales manager, Philadelphia district, Superior Steel Div., Copperweld Steel Co., Carnegie, Pa.

B. M. Ashbaucher, appointed manager, Chicago district sales, American Steel & Wire Div., U. S. Steel Corp.

C. E. Becker, appointed manager, manufacturing, Buflovak Equipment Div., Blaw - Knox Co., Buffalo, N. Y.; **R. H. Lewis,** appointed sales manager.



C. W. Bishop, appointed sales manager, Analytical and Control Instrument Div., Consolidated Electrodynamics Corp.; **R. D. Enochs,** named manager, Dallas district sales office.

M. L. Murdock, appointed vice president and general manager, Standard Products Div. of Byron Jackson, Div. of Borg-Warner Corp.

H. A. Boas, Jr., appointed director, marketing, The Budd Co., Philadelphia.

C. W. Blade, named sales representative, New England, Firth-Loach Metals, Inc., McKeesport, Pa.

J. J. Hannigan, appointed superintendent, Open Hearth Dept., Alan Wood Steel Co., Conshohocken, Pa.

J. I. Collins, appointed Chicago district sales manager, Stainless Steel Div., Jones & Laughlin Steel Corp.; **W. E. Templer,** promoted to

Count on *Continental* to

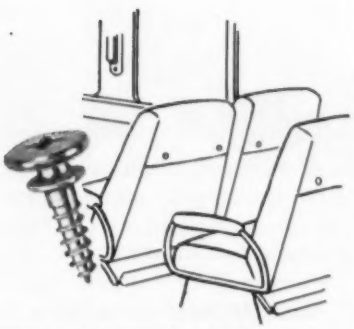
meet special fastening problems

with specialized cost-saving experience

Continental Assembly Engineers' Specialized approach to fastener trouble-shooting assignments gets you the right answer promptly, with the biggest cost savings — for two reasons.

First, since Continental can supply more types of standard fasteners, from stock, their recommendations are unbiased. They can tell you if some "standard" you've overlooked will meet your needs.

Second, if a "special" is the best answer, you can rely on Continental's unlimited experience to design and produce a fastener that will meet all specifications at the lowest possible cost.

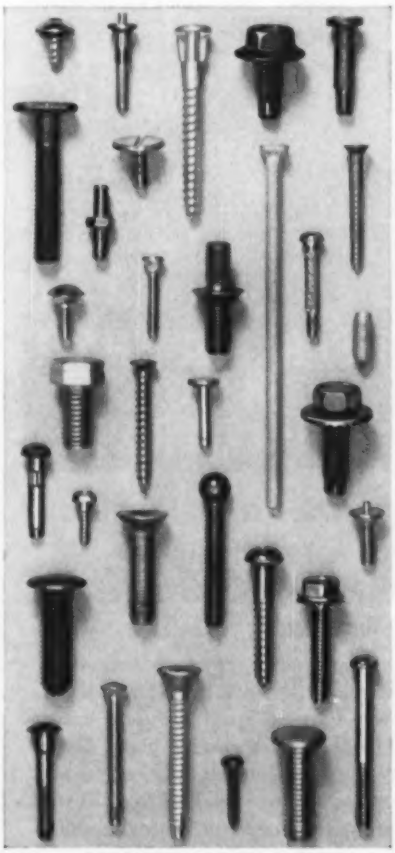


SPECIAL HOLTITE® PHILLIPS
button-head screw replaces two-piece fastening . . .

A bus builder asked Continental Assembly Specialists how to simplify installation of towel-holding buttons on back of bus seats. Separate wood screw and metal button being used caused slow work, with many pieces dropped and wasted.

One-piece button head special screw designed by Continental reduced parts cost 10%. Easy installation of simplified fastener provides much bigger saving in assembly costs.

COST LESS
SPEED ASSEMBLY



HOLTITE® NYLOK®
self-locking screws solve problem of screws loosening in chain saw

When consulted by a chain saw maker on the problem of screws vibrating out, Continental Assembly Specialists had the answer in HOLTITE® NYLOK. Two of the several types of machine screws furnished, all fitted with the resilient nylon plug, are illustrated. These NYLOK screws do not loosen in spite of extreme vibration, keep the saws "on-the-job". Previous customer complaints of high maintenance costs were eliminated.

END COMPLAINTS OF
HIGH MAINTENANCE COSTS

"Special" attention like this will pay off for you . . .

It costs you nothing to talk to a Continental Assembly Specialist. And, as soon as he digs into your problem, you'll see what we mean by "specialized experience". For prompt service, write or phone: Continental Screw Co., 450 Mt. Pleasant St., New Bedford, Mass.

MEMBER
SCREW RESEARCH
ASSOCIATION

CONTINENTAL
HOLTITE FASTENERS

HOLTITE PHILLIPS AND SLOTTED HEAD
WOOD • MACHINE • TAPPING • THREAD CUTTING • SEMS • NYLOK
HY-PRO PHILLIPS INSERT BITS AND HOLDERS

FOR BIG POWER use Maxi-Power

PARALLEL SHAFT-HELICAL GEAR DRIVES

1. Heavy duty, reinforced design housing for permanent alignment, rigid shaft support.
2. One mesh per reduction—fewer moving parts.
3. Broad faced helical gearing—high quality, accurately hobbed for greater strength, durability. Uniform tooth deflection under load . . . no uneven wear.
4. Shafts firmly held in place. Positive gear location assures full tooth engagement across entire face.
5. Smooth, overlapping mesh, close backlash tolerances, no oil trap provide quiet operation, less heat generation.
6. Heavy duty, anti-friction bearings. Conservatively rated for wide range of operation.

Capacities to 1550 H.P.

★ **Single, Double, Triple Reductions**

★ **Standard Ratios from 2.08 to 1 up to 360 to 1**

★ **9 Shaft Arrangements**

There's more capacity, greater stamina and longer service life built into Foote Bros. Maxi-Power Parallel Shaft Drives. Simple, balanced design, fewer moving parts, heavy duty construction, efficient lubrication and conservative ratings make Maxi-Power drives the logical choice for critical applications and severest operating conditions.

You can depend on Maxi-Power Drives to produce maximum performance with minimum attention because they're built for just that kind of service.

Write for Engineering Manual MPB—has complete details and selection data. There's no obligation.

this trademark stands for the finest industrial gearing made

T. M. REG. U. S. PAT. OFF.

FOOTE BROS.

Better Power Transmission Through Better Gears

FOOTE BROS. GEAR AND MACHINE CORPORATION

4565 South Western Boulevard Chicago 9, Illinois

purchasing agent, Mill & Mine Supplies.

S. J. Renton, appointed plant superintendent, Interstate Drop Forge Co., Milwaukee.

P. A. Gaebe, promoted to asst. Eastern regional sales manager, Kaiser Chemicals Div., Kaiser Aluminum & Chemical Sales, Inc.

Dr. J. D. Bode, promoted to research supervisor, Research and Development Dept., Jones & Laughlin Steel Corp., Pittsburgh.

E. T. Michalek, promoted to asst. sales manager, SpeedWay Div., Thor Power Tool Co., Chicago.

E. W. Guyer, named general manager, Precision Engineering and Gear Branch, Pesco Products Div., Borg-Warner Corp., Hialeah, Fla.

S. M. Halliday, appointed sales engineer, Renite Co., Columbus, O.

Rene Ramseier, appointed design engineer, new products and project

installations, American Buff Co., Chicago.

D. A. Mallett, appointed application engineer, Furnace and Kiln Div., Selas Corp. of America, Dresher, Pa.

Phillip Hall, appointed manager, industrial sales, A. Schrader's Son Div., Scovill Mfg. Co., Brooklyn, N. Y.

S. W. Riley, appointed chief project engineer, Quaker Rubber Div., H. K. Porter Co., Inc., Philadelphia; **E. G. Harvey,** appointed sales engineer, Quaker Rubber Div.

Vincent Moore, named chief of design, Hamilton Standard, division of United Aircraft Corp.

R. Y. Neiley, appointed district sales supervisor, Chicago, Sperry Products, Inc., Danbury, Conn.

J. F. Kloskey, appointed Eastern representative, Precision Extrusions, Inc., Bensenville, Ill.

C. S. Mills, promoted to supervising chemist, Research Div., Armco Steel Corp., Middletown, O.; **J. F. Woodruff,** named supervising spectrochemist, Research Div.

J. F. Carroll, appointed sales engineer, New York, F. X. Hooper Box Machinery Dept., Koppers Co., Inc., Baltimore, Md.

W. R. Schiller, appointed sales engineer, Eichleay Corp.'s Western Div., Santa Clara, Calif.

P. J. Fountain, appointed asst. manager, stainless steel sales, Boston steel service plant, Joseph T. Ryerson & Son, Inc.

Robert Hayes, appointed acting general superintendent, Truscon Div. screen plant, Canton, O., Republic Steel Corp.

George Thorn, appointed sales manager, Belting Div., Boston Woven Hose & Rubber Co., Div., of American Biltrite Rubber Co.

CRANEMASTERS

. . . fill the bill for

CONTINENTAL CAN CO.

This 10-ton cab-operated *Cranemaster* is the first of two in service for Continental Can Co. Like so many other manufacturers, Continental Can Co. found Cranemasters *the top initial value . . .* with lasting satisfaction assured by Abell-Howe's years of experience in building overhead handling equipment that better *fills the bill* for industry of all kinds.

CAPACITIES TO 15 TONS
—SPANS TO 60 FT.

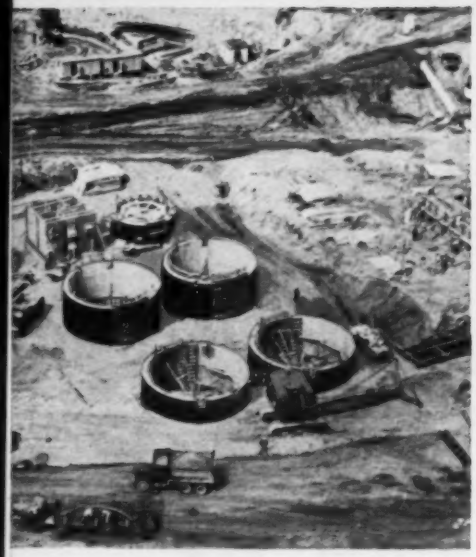
CRANEMASTERS
FOR BETTER CONTROL OF COSTS!

First, you save on Abell-Howe low engineering and production costs! Then you save on operating costs because of *Cranemaster* speed and dependability... and the precise control you need for the most demanding lifting-loading jobs.

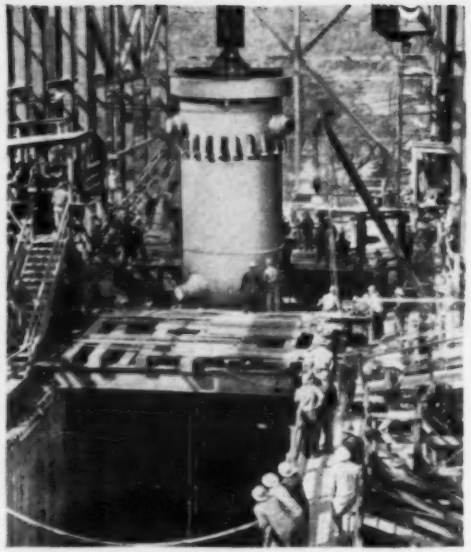
Send For Bulletin C-108

7747 Van Buren Street **ABELL-HOWE COMPANY** Forest Park, Illinois

A Dravo workman is lowered into the stainless steel-lined reactor vessel at the Shippingport Atomic Power Station.



Early construction on waste disposal plant. It will handle all radio-active wastes originating in the atomic power plant.



Lowering 150-ton reactor vessel. Special field-designed suspension system positioned it with watchmaker's accuracy.

Typical portion of the 10 miles of piping (ranging from ½-inch to 18-inch diameter) installed in the reactor plant.

Plant went "on stream" December 18, 1957—and stayed "on stream"—a tribute to the men and companies who made it possible.

Dravo at work...Shippingport, Pa.

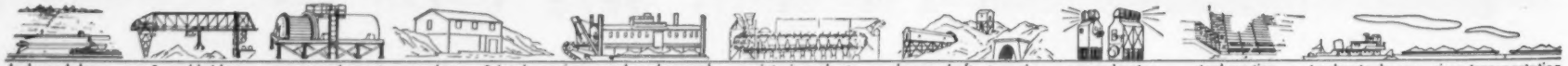
Dravo was selected more than two years ago to put together the vital nuclear system of the nation's first full-scale commercial atomic power plant. This part of the project required a force of 1100 men at the peak of construction. Dravo's responsibilities included installation of the reactor vessel, all mechanical and electrical equipment as well as fabrication and installation of complicated piping systems which form the "arteries" of the nuclear portion.

Now at full power and synchronized into the Duquesne Light System, the Shippingport project joins a long list of Dravo accomplishments in the field of special and difficult construction for industry and the nation. DRAVO CORPORATION, PITTSBURGH 25, PA.

At Shippingport, Dravo was a subcontractor to Westinghouse Electric Corp., which designed and developed the nuclear reactor under contract with the Atomic Energy Commission. Duquesne Light Company, in addition to providing the conventional portion of the plant, is operating the entire facility.

DRAVO
CORPORATION

Blast furnace blowers • boiler & power plants • bridge sub-structures • cab conditioners • docks & unloaders • dredging • fabricated piping • foundations • gantry & floating cranes • gas & oil pumping stations



locks and dams • ore & coal bridges • process equipment • pumphouses & intakes • river sand and gravel • sintering plants • slopes, shafts, tunnels • space heaters • steel grating • towboats, barges, river transportation

Titanium and Zirconium Alloys

produced by TAM in a practical range of compositions...

High Carbon FCT
Effective deoxidizer and cleanser for medium and high carbon steels.

Medium Carbon FCT
Deoxidizer and cleanser with less increase in carbon content of the steel.

Carbortam*
FCT Alloy containing boron for hardenability.

40% FCT
25% FCT
For Alloy steel with a residual titanium content.

Foundry Ferro Titanium
Deoxidizer, grain refiner and graphitizer for cast iron.

Manganese Titanium
Deoxidizer in high grade steel or non-ferrous alloys.

Nickel Titanium
Practically carbon-free source of titanium in nickel base alloys.

Silico Titanium
Titanium source in aluminum or master aluminum alloys.

Ferro Aluminum Zirconium Alloy
Zirconium source in special alloys.

Titanium Carbide
Component in sintered cutting tools, jet engine parts, refractory material, abrasives.

Zirconium Cyanonitride
Zirconium for Zirconium Tetrachloride and for process metallurgical applications.

Zirconium Aluminum
Grain refinment in aluminum alloys and as a source of Zirconium.

Magnesium Zirconium Master Alloy
Efficient alloying of zirconium with magnesium.

Zirconites*
Sand and Flour — Mold Wash — Paste Wash — Utility Mix for foundry molds, cores, facings and linings.

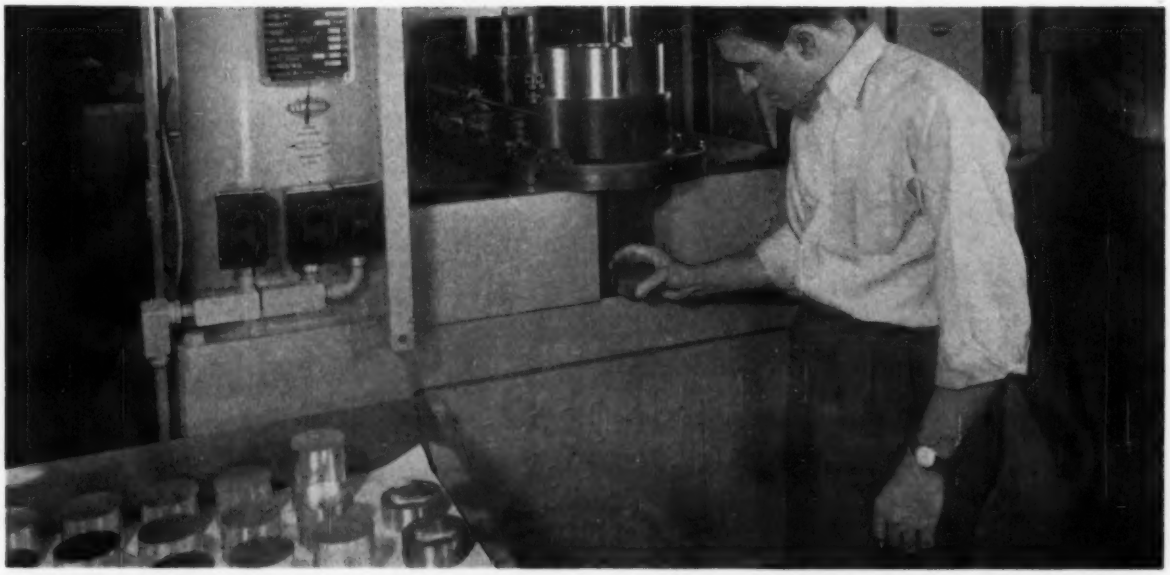
To insure prompt service... please address inquiries to our N. Y. C. address

TAM PRODUCTS
Registered U. S. Pat. Off.

TITANIUM ALLOY MFG. DIVISION
NATIONAL LEAD COMPANY

Laboratory and Plant: Niagara Falls, N. Y.
Executive Sales Office: 111 Broadway, N. Y. C.

*Reg. T. M.



FLOWS UNDER PRESSURE: Steel hob forms complex cavity in copper slug under pressure of 100-375 psi.

How Cold Hobbing Shapes Intricate Parts

By Alex Phillips—Dept. Head, Mechanical & Development Section, Magnetron Development Laboratory, Raytheon Mfg. Co., Waltham, Mass.

Some vital parts must have built-in accuracy at any cost. On it may depend the success or failure of the part—or even a whole system.

Step by step, the technical barriers of cold hobbing were lifted so that an intricately shaped part can now be made in a single stroke of the press.

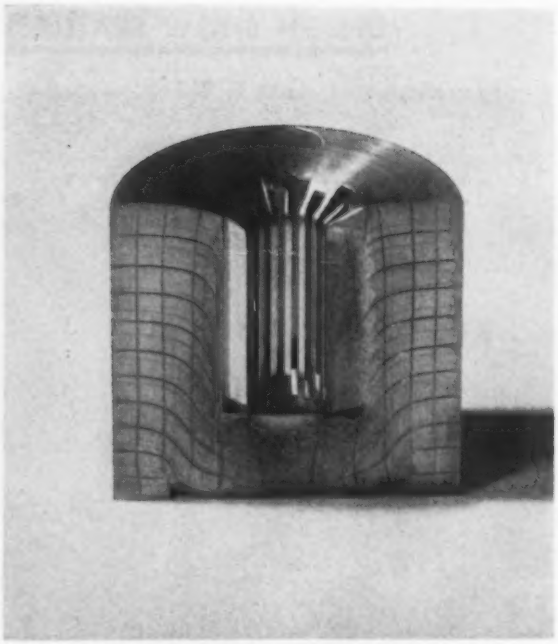
▪ Cold hobbing of a multiple cavity magnetron involves only a single piece of copper—a relatively small one at that. But it probably holds more lessons on treating and shaping metal than can be found in any other piece of metal of similar size.

As simple a part as it may seem at first glance, the magnetron cavity as it is now made in production took 15 years of intensive and painstaking development work by Raytheon Mfg. Co.'s Microwave & Power Tube Dept., Waltham, Mass.

The magnetron cavity itself requires extreme accuracy, and considerable intricacy in design, if it is to perform its highly important function. Any deviation in dimensions or geometry will cause the resonant frequency of the tube to vary. And should this occur, detec-

Design Engineering Show Facts

Place:	**International Amphitheatre, Chicago.**
Dates:	**Monday, April 14, through Thursday, April 17.**
Show Hours:	**12:00 noon to 5:30 pm daily.**
Conference Hours:	**10:00 am to noon on Monday, 9:30 am to noon on Tuesday, Wednesday and Thursday.**



LINES OF FORCE: Scribed lines show direction of metal flow in a sectioned magnetron cavity. Displacement ranges from 20-40 pct.

EXACT COPY: Note detail of cavity (right) which was hobbed with the complex tool pattern. Cavity needs no further finishing.

tion and guidance of missiles, as well as flight controls, would be difficult.

Metal Like Putty—Perhaps the simplest way to define cold hobbing is to say that it is a process for displacing a relatively ductile metal mechanically with precise control over the dimensions of the part. But it would be amiss not to mention the essential role which tooling plays in guiding the plastic movement of the metal.

As for the metal itself, there's practically no other choice. Oxygen-free high-conductivity copper has just about all the characteristics needed in a multiple cavity magnetron. It has good electrical conductivity, good heat transfer, is sufficiently ductile and workable, and gives a fine finish.

Use Alternate Heating—The start of the cold hobbing process is in the preparation of slugs. These are made from rectangular cast ingots by first hot forging them into round bars of the approximate slug diameter. This is done by alternate heating and hammering of opposite ends of the bar. Conduction along the bar from the hot and to the cool end causes partial annealing and grain growth, resulting in non-uniform structures and conditions throughout the bar's length.

After a billet has been forged to approximate shape, its rough, oxidized surface is machined off in a lathe. It is later cut into slugs which are machined to their correct dimensions.

Studies and tests show that the best temperature to anneal copper for cold hobbing is between 625° to 650°C (1150° to 1200°F), depending somewhat on previous cold working of the material and its size. It's in this range that complete annealing takes place with hardness being reduced to 35 to 37 Bhn, yet no appreciable grain growth occurs.

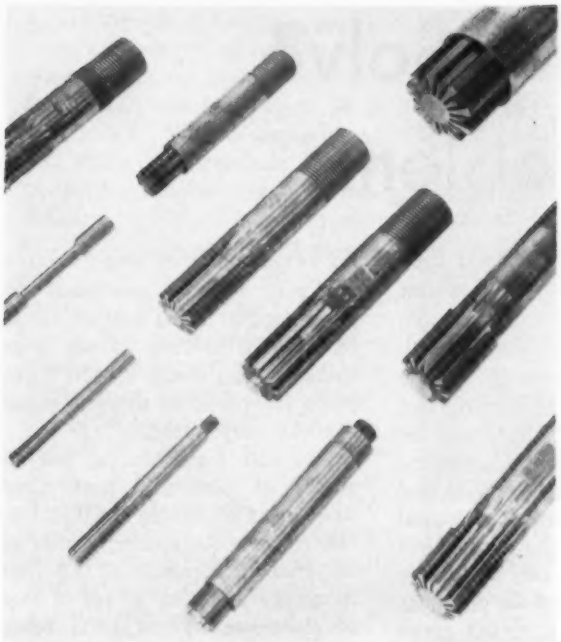
Tooling Complex — Even more important to the process than the metallurgical techniques for annealing the copper and controlling grain size in the slug are the methods for making the hob. For ordinary cold hobbing, many commercial steels would serve well for tooling. However, the complicated shapes needed for multiple cavity magnetrons change the tooling picture considerably.

Only a few analyses of steel can be used. The one found most universally suitable has an analysis of 0.70 to 0.80 C, 2.0 Mn, 0.5 Si, 1.5 Cr and 1.5 Mo.

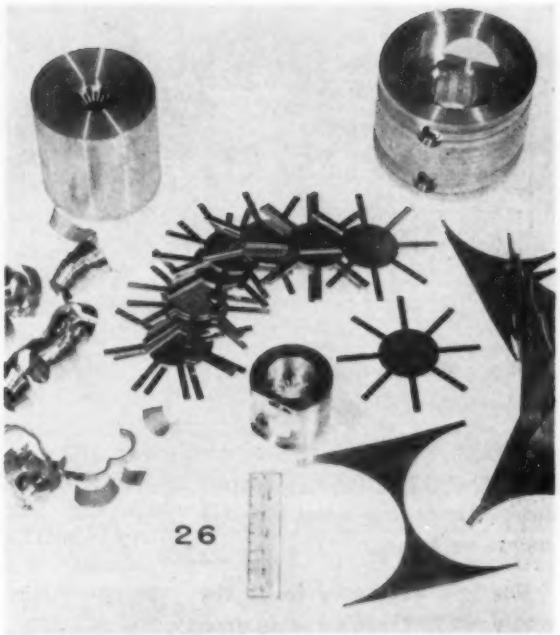
Great care must be given to heat treating practice in making the hob blanks. Unless this is done, and particularly at the time of the quench, there is little or nothing that can be done later to rid the tool of undesirable stresses.

The job of producing the proper configuration in the hob is virtually a story in itself. It must be done by a complicated grinding operation. The grinding machine had to be developed from scratch by Raytheon since there was no such machine on the market.

Each Step Controlled—Types of grinding wheels and coolants also were studied carefully, as were the coolant pressures and metering de-



SAMPLE TOOLING: Here are just a few hobs of intricate design which Raytheon has used. Each takes about three weeks to make.



ALTERNATE METHOD: Cavity at upper right was formed from stacked sheet copper which was stamped and furnace brazed. Rest is scrap.

vices, to avoid getting checkmarks on the tool which would lead to failure under the high pressures used in hobbing. Indexing mechanisms with interlocking systems had to be worked out so that tolerance accumulations would not occur in the tool geometry.

Considering that some intricate hobs would take as much as three weeks of continuous grinding, accurate temperature controls were installed in the machine. Filterization of the coolant was still another problem which had to be worked out to keep foreign particle size down to two microns. But in spite of all the controls and devices to assure foolproof performance, the accuracy in the tool is still largely dependent on the skill of the operator.

Wax Reduces Pressure—For lubrication between the slug and hob, a suspension of wax in carbon tetrachloride works quite well. It is applied to the slug by brushing, leaving a thin, uniform film which dries quickly. The hob is also lubricated by dipping in the same solution.

When slugs of steel are hobbed with a steel hob, these metals, having an affinity for each other, tend to gall and pick up. However, this can be prevented by first dipping the clean hob into a solution of copper sulphate to coat it with a thin layer of copper. When it dries, the hob is dipped in the wax solution as before. In fact, the wax should be applied to the hob after each use.

If a lubricant is to be effective in cold hobbing, it should (1) withstand pressures up to 300,000 psi, (2) be removable easily, (3) not contaminate the copper, (4) be easily applicable, and (5) adhere well.

The hobbing press is usually a 100- to 1350-ton hydraulic. Its control and alignment should be such as to make it compatible with the hobbing tool. In the case of a 1350-ton press, there's a force of 2500 psi on the 21-in. diam ram. This gives some idea of the tremendous pressure exerted on the hobbing tool. Any force other than compressive would shatter the hob.

Savings Run High—In view of the seemingly long series of precisely-controlled steps in cold hobbing, what gains are to be found over other methods? First, it's probably the only method which can be seriously considered for producing multiple cavity magnetrons in quantity. A complete press cycle takes 1½ minutes — and on production runs it's lower. To date, the exact savings have not been determined. Estimated savings run as high as 1000 to 2000 pct or more. But even more important is the fact that cold hobbing imparts a degree of accuracy that cannot be matched by any other method.

Tool life has been running at an average of several thousand pieces. But even these results are not the ultimate. Raytheon continues to make process refinements.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Reinforced Plastics Solve Heat-Strength Problems

By J. D. Flynt—Technical Liaison, Cincinnati Testing and Research Laboratories, Cincinnati

You can't ignore reinforced heat-resistant plastics.

They're proving the best answer to many of today's biggest design headaches—and the only course on some.

Nor is it necessary to go the whole road. There's a wide area in between where plastics and metals work hand-in-hand.

Learn how to make these new structural materials serve you.

▪ In the broad sense, a reinforced plastic is a hard, thermoset material made up of fibrous reinforcement bonded together with an organic, semi-organic, or inorganic resinous material.

Types of reinforcements used include asbestos, glass or quartz fibres in many forms, from loose filaments through mats and felts and even woven cloth. For non-heat resistant materials, it includes paper, cotton, sisal or almost any fibrous material.

There are also a number of basic polymer groups, or families of resinous materials, which may be used. These include polyesters, phenolics, epoxides, melamines, and silicones. But when the general term is modified by the words "heat resistant," it rules out all of the polymer groups except the phenolics and silicones. This doesn't mean that certain members of the other groups are not heat resistant, or that other entire groups might not have some heat-resistant qualities. In our present terms of reference, however, the phenolic and silicone materials are by far the most important.

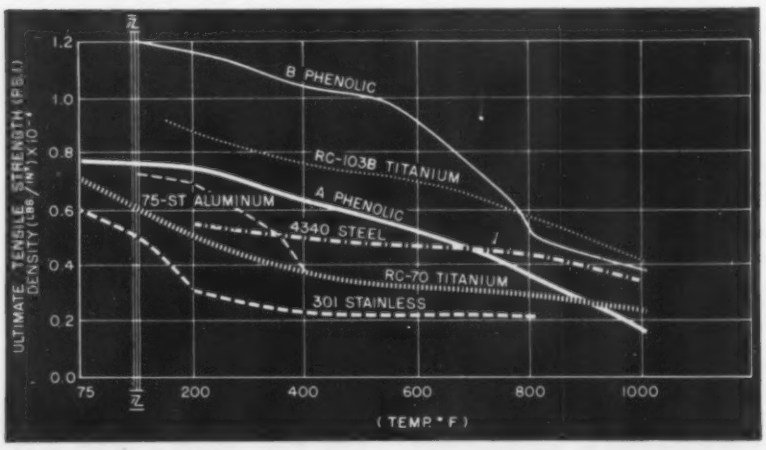
General Properties — A reinforced phenolic laminate made of glass fibre cloth and any of half a dozen commercially available phenolic resins will display a flexural strength at room temperature of 70,000 to 90,000 psi and a modulus of elasticity of about 4.00 x 10^6 psi. After a protracted exposure at 500°F the laminate could be expected to keep 75 pct of its strength when tested at 500°F, or 95 to 100 pct of its strength, tested at room temperature.

At such temperatures, aircraft grades of aluminum have yield strengths of something less than 10,000 psi; and the specific gravity of the phenolic laminate (2.00) puts its weight at 60 to 70 pct of that of aluminum. When parts being manufactured have definite directions of principal stress (as most aircraft parts do) it is sometimes possible, through orientation of reinforcement, to obtain uni-directional strengths as high as 150,000 psi and moduli of elasticity as high as 7 to 8 million.

Most heat-resistant reinforced plastics can be considered for indefinite life applications up to 400°F. Several have an indefinite life of 500°F, and many will have a significant useful life at higher temperatures, even in the thousands of degrees.

However, such useful life definitely becomes a function of time. Thus, in a part operating at 600°F one might expect a useful life of perhaps 100 to 200 hours; while a part that had to operate at 10,000°F might have a useful life of only a few seconds. There are many aircraft parts which can be replaced on a 50 or 100 hour basis, and many missile parts which must last but a few seconds.

More Latitude — The type of stress-strain curve displayed by reinforced plastics under static loading is quite different from the curve for a metal. By including proper safety factors, the designer is often able to use the ultimate strength as his design strength, rather than



STRENGTH-WEIGHT vs HEAT: Reinforced phenolics prove superior to most aircraft structural materials in comparison of tensile strengths on a strength-to-weight basis.

a yield strength or point of tangency.

In contrast to most metals, a good reinforced plastic will have a point of tangency at about 50 to 70 pct of its ultimate strength, and will show no discernable yield or permanent distortion prior to final failure.

Heat-resistant reinforced plastics also differ in terms of dynamic strength. Because the reinforced plastic is a nearly non-ductile material, it can support a dynamic load representing a very high percentage of its ultimate strength, for long periods of time. There are cases where reinforced plastics can be made into shapes which will stand up under fatigue testing from 5 to 10 times as long as a similar metal part having a much greater basic ultimate strength.

How They're Made — Standard reinforced plastic laminates are usually made in two ways: the first is the high pressure molding method, in which materials are cured in a press, under pressures from 1000 to perhaps 10,000 psi at temperatures of 300 to 350°F.

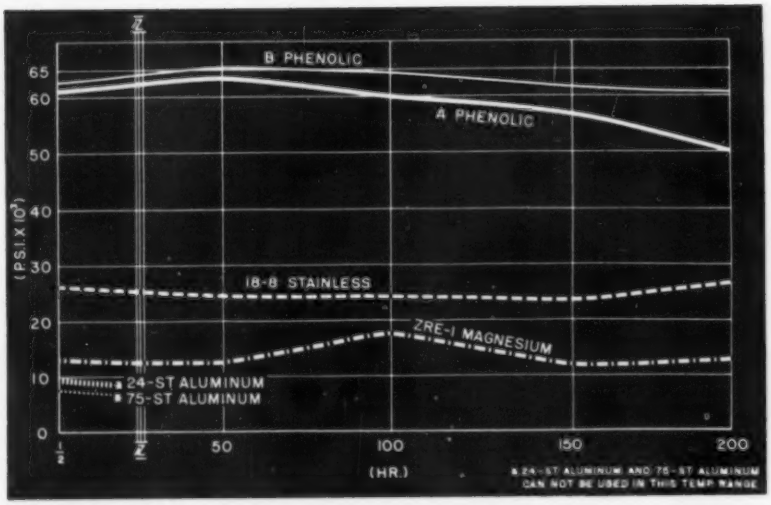
In the second method, called the vacuum bag technique, the raw material is placed on a wood, plaster, or metal form; a membrane (usually rubber) is put around it and vacuum is drawn on the entire assembly. Then the assembly is placed in an oven and cured under one atmosphere of pressure at 250 to 350°F.

When reinforced plastics were first considered as heat-resistant structural materials for aircraft, it soon became obvious that the old manufacturing methods would not produce parts of any value. Accordingly, researchers developed a new system for curing condensation resins.

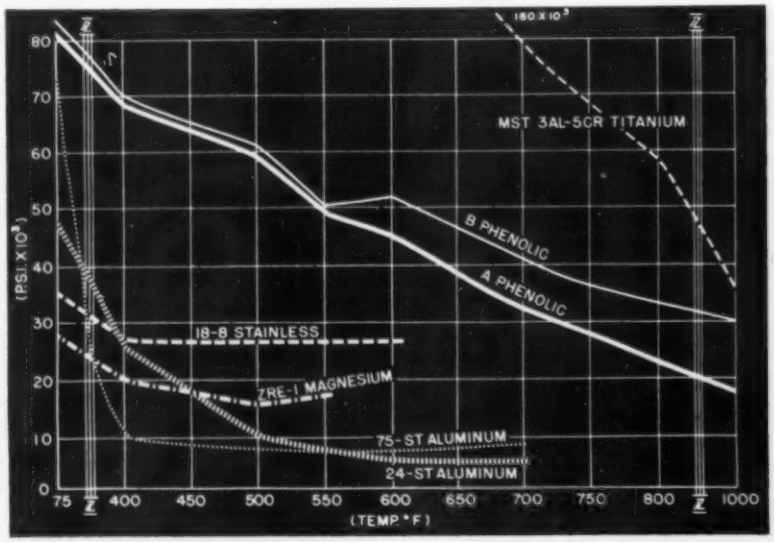
Less Pressure, Oven Cure—Basically, the new type of cure is similar to the high pressure molding technique, but with certain very definite alterations: The first being that pressures as low as 175 to 200 psi were found adequate; the second, that no attempt is made to take the part to a complete cure during the molding operation. Thus, shorter times are used and much lower temperatures. The molding is merely cured under pressure until it reaches a completely thermoset condition—the point where it no longer becomes a liquid or changes shape with additional heating.

Once the part is thermoset, it is removed from the press or mold and placed in an oven, where, under low heat transfer conditions, the cure proceeds at a very slow rate. This oven-curing process has become known as a postcure. The term is a misnomer, since it implies that some type of processing is taking place after the cure is completed; in reality, it is a part of the curing process.

Gets Rid of Water—During postcure the moisture which has been



STRENGTH vs TIME: Comparing 0.2 pct yield strengths after exposure at 500°F, plastics retain their flexural strength with time.



STRENGTH vs HEAT: Reinforced phenolics are consistently stronger over a wide temperature range in comparison of 0.2 pct yield strength after ½ hour exposure to heat.

released during molding and curing (and, because of the molding pressure used, is still in solution in the resin) is released very slowly over a period of time. Thus, the water molecules are able to work their way out of the part by travelling between the relatively large molecules of cured plastic material.

When the entire postcure is complete, there is no large amount of latent moisture ready to cause trouble if the part is exposed to shock heat; nor is there a porous internal structure to reduce the mechanical value of the material and make it susceptible to rapid oxidation.

For the most part, the new manufacturing method applies only to reinforced plastics which cure by condensation. Some materials—for example, the epoxides and polyesters—cure by a mechanism known as addition. An addition-curing product doesn't release any moisture, so the older methods are sometimes quite satisfactory. But for the present, at least, epoxides and polyesters are of much less importance than phenolics and silicones as heat-resistant structural materials; and even some of the more heat-resistant members of these two addition-curing families are now made by processes very similar to those for the condensation-curing materials.

Postcure is Easy—Many manufacturers who are accustomed to metal processing object to the oven cure or postcure. In most cases, however, the objections are more psychological than anything else. Ovens are, after all, the least expensive type of industrial equipment, either to purchase or operate; and the amount that an extensive oven postcure adds to cost is almost nil.

It does mean, however, that there is a certain delay from the time the part comes out of hard tools until it can be used. But since this is known in advance, it can be planned when production schedules are set up.

About Costs—The cost of making parts from heat-resistant reinforced plastics is quite often higher than for many types of metal processing. Future improvements in manufacture, and lower prices of raw materials as a result of wider use, will probably reduce some aspects of costs. But at least part of the total cost may always stay rather high.

The basic cost of raw materials ranges anywhere from $2.00 a pound for the least expensive materials to as much as $8.00 a pound for the more exotic types. The general average is $3.00 to $4.00 per pound. In most cases, tools on which reinforced plastic parts must be molded are hardened chrome-plated steel, and so quite expensive. Production must therefore be quite high before the cost of tooling becomes a minor part of ultimate cost.

The labor required to produce a particular part might vary from as little as a tenth of a man-hour up to 5 to 6 man-hours, depending upon part size and complexity. Labor is usually semi-skilled, perhaps not as cheap as unskilled factory labor, but certainly not as expensive as highly skilled machine operators. Thus, final cost will be between $3.00 and $20.00 per pound, with an average of $5.00 to $8.00 per pound.

Compared With Metals—In general, metal parts produced by die-casting or stamping are far cheaper than reinforced plastic parts. Metal forgings are sometimes cheaper and sometimes more expensive; if forging requires a large number of dies to produce a fairly smooth finish and close tolerances, reinforced plastic might be cheaper. Metal parts made on machine tools, or by any method which requires extensive finishing labor, are generally more expensive than reinforced plastic.

One of the cost areas in which reinforced plastics are usually at a disadvantage is in development and prototype manufacture. All too often, production-type tools must be used on the prototype level. Yet, to risk manufacture without necessary development is quite a gamble, and to make study prototypes on a cut-rate basis is likely to be a complete waste of time and money.

Today's Uses—At the present time, heat-resistant reinforced plastics are being used chiefly in the aircraft, missile and associated industries. In piloted aircraft, heat-resistant reinforced plastics are found in radomes, heat ducting, leading edges, control surfaces, and similar applications. In most of these, the materials are being used more for their insulating qualities and radar transparency than as primary load-carrying structures. However, they are used in a number of cases in what the aircraft industry calls secondary structures.

In jet engines themselves, heat-resistant reinforced plastics are being developed for many primary structural uses. Virtually every component of a jet-engine compressor has been built, at least in prototype, from a heat-resistant reinforced plastic. Most of the performance information about such structures is classified; but because of their high strength to weight ratio (particularly at elevated temperatures) and extreme resistance to fatigue, plastics can, in many cases, outstrip metals by as much as 500 pct.

In missiles, heat-resistant reinforced plastics are being used to an even greater extent than in piloted aircraft. Almost every component of a rocket-motor-driven missile has been made from reinforced plastic. This includes the motor itself.

At rocket-motor temperatures, there is a certain amount of erosion of even the best heat-resistant reinforced plastic; but because of their light weight and good insulating qualities, they are often found more useful than metals. In the primary structure of the missile, they are used for wings, fins and sometimes the entire fuselage.

Future Possibilities—The present uses of reinforced plastics by the military suggest many areas of application for civil industry in the

WORK TOGETHER: Experimental glass-reinforced phenolic propeller seal shows how metals and plastics can be combined to lick heat-strength-weight problems.

BUSINESS END: Even rocket nozzles are being made of glass-reinforced phenolic. In this case, the reinforcement appears as small chopped strands of fibre.

foreseeable future. Trucks, building equipment, earth moving equipment and, indeed, almost any vehicle presently driven by a reciprocating engine will, no doubt, be driven by gas-turbine engines. And heat-resistant reinforced plastics will find wide use in such engines, since they will result in a lighter, less expensive, and more reliable prime mover. For that matter, wide use of reinforced plastics in almost any type of turbine cannot be too many years away.

In short, any part which has a complex shape, must be light weight, and have high strength at elevated temperatures, especially under dynamic conditions, is a logical candidate.

Go Quickly With Caution—Engineers seem to run to two extremes in their approach to heat-resistant reinforced plastics, or for that matter, plastics of any kind. One type completely ignores plastic materials, considering them worthy of nothing better than making children's toys. He's likely to wake up one fine day and find his competitor has a vastly improved product using a number of plastic parts.

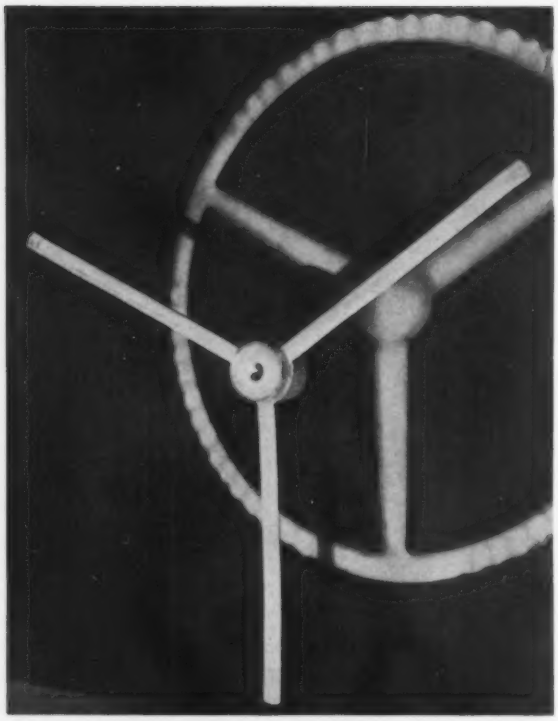
On the other hand, too many engineers and businessmen fall victim to what is known as plastics fever. This is a malady usually contracted at the yearly convention of a technical group; in some cases the germ is carried by printer's ink. The symptoms are universal: the victim frantically pulls blueprints from his drawing file, runs with them to the nearest plastics molder and demands immediate delivery of parts.

The prognosis of plastics fever is usually fatal. Plastics are not miracle materials; they do have unique properties and, where properly applied, can be of great service. However, they are by no means going to make metals obsolete.

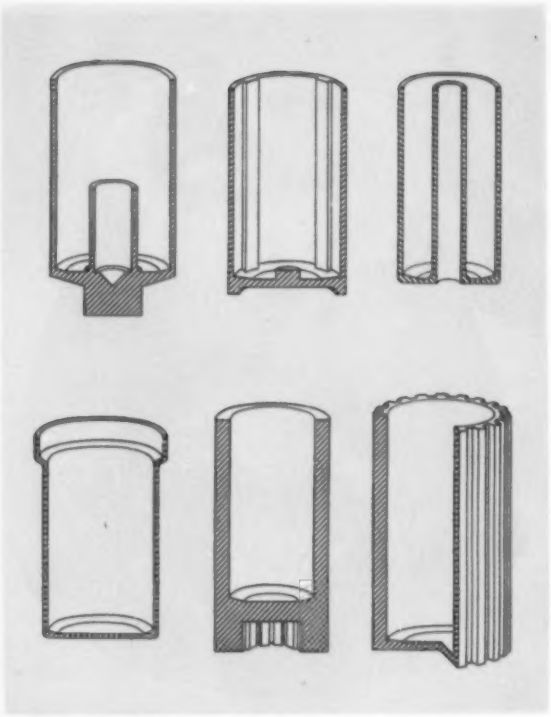
The Middle Road—Between the extremes of plastics fever and sleeping sickness, there is a sensible middle ground. The chief engineer should start monitoring the industry by having his key designers become acquainted with reinforced plastics.

If local universities have courses in plastics engineering, encourage key men to enroll. Membership in one or more of the plastics technical societies and reading of various technical journals are steps in the right direction. Probably the best solution, if it is economically feasible, is to retain a good plastics engineer to start working with advanced designers.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.



HERE'S THE LATEST: Lateral impacts give the process another dimension and suggest new design possibilities. (Alcoa photo.)



SHELLS APLENTY: Impact extruded shells can take many forms, as these examples show. (All sketches courtesy Aluminum Co. of America.)

Aluminum Impacts Open New Areas for Design

By E. J. Egan, Jr.—
Machinery Editor

Can your product be made of aluminum? Can it also be made as an impact extrusion?

If so, there's probably no better nor less expensive way to produce it.

Here's what every design engineer should know about this unique metal forming process.

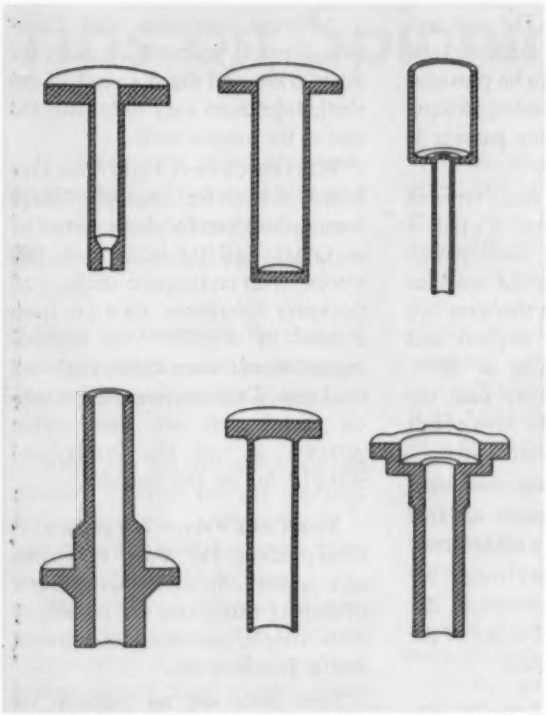
▪ Never before have design engineers had so many precision metalworking techniques at their disposal. Even so, the aluminum impact extrusion process is fast becoming one of the handiest, most economical tools on their list.

It wasn't always this way. A scant dozen years ago 95 pct of aluminum impacts were reverse-extruded collapsible tubes for toothpaste, shaving cream and the like.

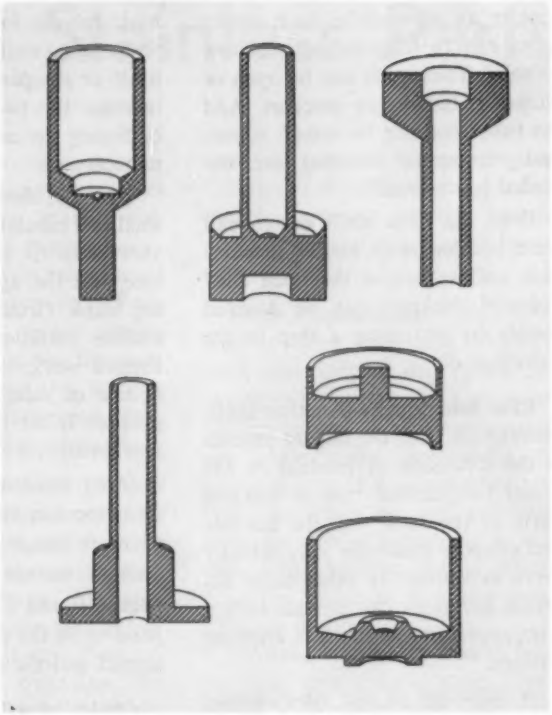
Suddenly the process put on a pair of seven-league boots. Reverse extrusions bloomed in a host of design variations. Forward impacts swept ahead in their own right and were also linked with reverse forms in myriad ways. Lateral impacts are the latest type to challenge the ingenuity of designers, and there seems little doubt that all three forms will be tied together soon.

Many New Uses — Collapsible tubes are still important, but more complex impacts now serve almost every phase of industry. Automobiles use a dozen or more different forms in critical steering, brake and transmission assemblies. Airplanes depend on impact-extruded fuel pump bodies and hydraulic landing gear cylinders. Other and larger forms appear in advanced missile designs.

The alert design engineer, searching for the best and most economical way to make a new part or product,



MORE IDEAS: There's almost no limit to the types of flanged or cupped-end tubes that can be impact extruded quickly, at low cost.



SAVES CHIP WASTE: Smooth-finished blanks, impacted to precise dimensions, often eliminate costly machining operations.

might well look at aluminum impacts in this way: If the product in question can use any of aluminum's unique properties — light weight, strength, machinability, corrosion resistance, high electrical and heat conductivity—the possibility of impact extruding it should be investigated.

For the impact extrusion process guarantees (1) a dense, porosity-free, cold-forged structure; (2) close tolerance parts with a minimum of excess metal to be trimmed or machined away; (3) smooth, scale-free surfaces that can be painted, anodized or lithographed with little or no preparation.

Low-Cost Winner—What's more, all of these benefits are built into aluminum impacts in a single press stroke, and literally in the wink of an eye. Familiar items such as motor housings, vacuum bottle shells, flashlights cases, and condenser cans stream from high speed presses at rates up to 4200 pieces per hour. Wherever the product design is suited to the technique, impacts usually win the production-cost contest hands down.

Assuming that the end use for a particular part doesn't bar the use of aluminum, how does the design engineer know if it can be made as an impact? The truth is that he can't always tell. Although a number of designs are virtually standard items, in other ways the process is still more of an art than an exact science.

Still there are certain part configurations that should automatically suggest impacts to the designer.

Shells Are Basic—For example, any hollow cup or shell with one closed end and a height of more than 1½ to 2 times the diameter is a logical prospect. How big? At its Edgewater, N. J., works Aluminum Co. of America regularly impacts cylindrical shells up to 6 in. in diam and up to 20 in. long.

However, shells needn't be cylindrical. They can be square, rectangular, oval or polygonal in cross section. Symmetry of the shell form is desirable but not always mandatory, especially in shallow-depth parts.

Does the shell design call for a bottom that is round, or substantially thicker than the walls, or one that tapers up towards the walls from a recessed center? These are simple design variations for the impact process.

Built-In-Extras — With impacted shells, also, there's no need for secondary operations if the bottoms require bosses, wrenching lugs, tubular projections or recessed cavities. Such "extras," which are often machined into or attached to shells made by other methods, can be impacted in place as integral parts.

Integral center tubes are also impacted in a number of shell forms. One example is the typical oil filter

case in an automobile. Such center tubes can be long or short, hollow or solid. Their ends can be open or closed as the design specifies. And the tube need not be round; square and rectangular sections are extruded just as easily.

Does the basic shell design call for a heavier, more readily machinable wall section at the open end? Sidewall thickness can be doubled simply by providing a step in the extrusion die.

Ribs Add Much—Another shell-forming plus for the impact process is the extrusion of internal or external longitudinal ribs as integral parts of the shell wall. In number and purpose these ribs may actually serve as splines. In other cases external serrations can provide both a trim appearance and a firm gripping surface.

A variation of the rib-stiffening technique is to extrude full length vertical partition walls inside the workpiece, thus making it a compartmented shell.

Tubes Are Key Items—Aside from the basic shell form, the design engineer should also view any closed-end tubular shape as a potential impact extrusion. The list of integral flanged-tube designs that can be impacted in a single low-cost operation is almost endless. So is the list of machining and assembly operations that can be saved thereby.

For example, a tube with an impacted flange at one end can be either open or closed at that end. Or if the flanged end is closed the opposite end can be open, and vice versa.

Flanges may also be formed at any point along the length of a tubular piece by combining forward and reverse extrusion in a single press stroke. Moreover, thick flanges are just as easy to make as thin ones, and stepped or tapered flanges will impact as readily as the flat variety.

To Save Machining—Tubes with cupped ends are variations of the basic tubular impact. The cup section may be walled off from the tube itself, or an opening can be provided between the two elements; drilling or boring the connecting passage is unnecessary.

Over and above the many types of shell and tubular impacts, it's only a short step to a third basic design category: the aptly named machining blank. Grouped in this area are endless variations of stepped and flanged workpieces, long or short, hollow or solid. In every case the purpose is the same, to save rough machining and costly chip waste.

Other machining economies stem from the fact that impacts are free of draft tapers and parting lines. Smooth surface finishes range between 40 and 250 microinches, depending on the size and shape of the impact and the alloy used.

Choice of Alloys—Actually, aluminum impacts can be produced from a number of alloys ranging from the commercially pure 1100 designation to the highest strength, heat-treatable wrought grades. The 1100 alloy is most frequently used. It extrudes easily and the strain-hardened properties induced by severe cold working are more than ample for many products.

For higher strength or improved machinability, alloys 6061 or 6151 are often specified. In the heat-treated condition, impacts made of these materials will have minimum tensile strengths ranging from 26,000 to 44,000 psi. Still higher tensile strengths, in the 55,000- to 75,000-psi range, can be had by heat treating extrusions formed from alloys such as 2014 and 7075.

Which Is Best?—It pays to select the alloy that best suits end use requirements. This permits minimum forming pressures and highest production speeds, hence lowest cost. As the percentage of alloying ingredients goes up, higher extrusion pressures are needed. This means that product designs must have heavier sidewalls and base sections.

Although minimum wall thickness depends primarily on both the alloy grade and the diameter of the shell, tolerances vary only with the size of the impact itself.

Wall thickness tolerances on round shells, for example, range from ±0.005 in. for shells up to 1½ in. OD, to ±0.015 in. for 6-in. OD pieces. With rectangular shells, wall thickness tolerances range from ±0.010 in. to ±0.015 in., depending on overall size and nominal wall thickness. Cross-sectional tolerances on these parts are held within ±0.008 in. on the inside and ±0.010 in. on the outside.

Tool Costs Vary—The press tools that produce the close tolerances and smooth finishes characteristic of impact extrusions are essentially quite simple, consisting of a punch and a matching die.

Tool costs are no problem on standard-size cylindrical, square and rectangular shells. Alcoa, for example, supplies such impacts in minimum quantities of 1500 pieces without tool charges. But a special impact design involves tooling-up expense. The design engineer should consider the total run of impacts over which such costs can be amortized.

Finishing costs may or may not be a factor with impact extrusions. Many commercial products require no additional treatment of the original surfaces. However, pieces may be polished to either a bright or a satin finish, and they can be colored by anodizing, lithographing, painting or lacquering.

Unique for the many benefits it now offers the design engineer, the aluminum impact extrusion technique promises even more for the future in terms of design flexibility, faster production and lower costs.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Tips on Spinning Stainless Parts

If you're now using stainless, or plan to use it soon, it will pay to know more about the advantages of spinning the stainless grades.

Here are some of the helpful pointers you'll want to follow—along with pitfalls to avoid.

▪ With the current emphasis on missiles, rockets, and gas turbines, the spinning of stainless steels is gaining new importance to designers and manufacturing engineers.

Why spinning? Because the spinning process is an efficient, relatively easy way of making a variety of hollow shapes from simple, sheet-metal disks.

Why stainless? Because it's an ideal material for applications requiring strength plus a high degree of resistance to the damaging effects of heat and corrosion.

Not All Alike — Fortunately, stainless steels lend themselves to cold-forming by spinning. This doesn't mean that they all have the same cold-forming characteristics. They don't—largely because of their individual mechanical properties and work-hardening behaviors.

All of which adds up to the fact that differences in spinning procedures for stainless steels are those made necessary in order to conform to the distinct properties of individual grades. Obviously, successful spinning depends on a working knowledge of both spinning techniques and the special characteristics of the stainless grade you're working with.

Manual vs Compression—There are two general types of spinning operations. One, called manual spinning, accomplishes shape change with little or no metal thinning. Another, called compression spinning, involves shape change with considerable metal thinning.

Better adapted to manual spinning are those chromium-nickel grades that have an initially low yield strength in the annealed condition, as well as a low rate of cold work (strain) hardening. Such grades require less power during spinning. Type 305 is the best of the Cr-Ni types in this respect. It is generally recommended when its other properties are adequate.

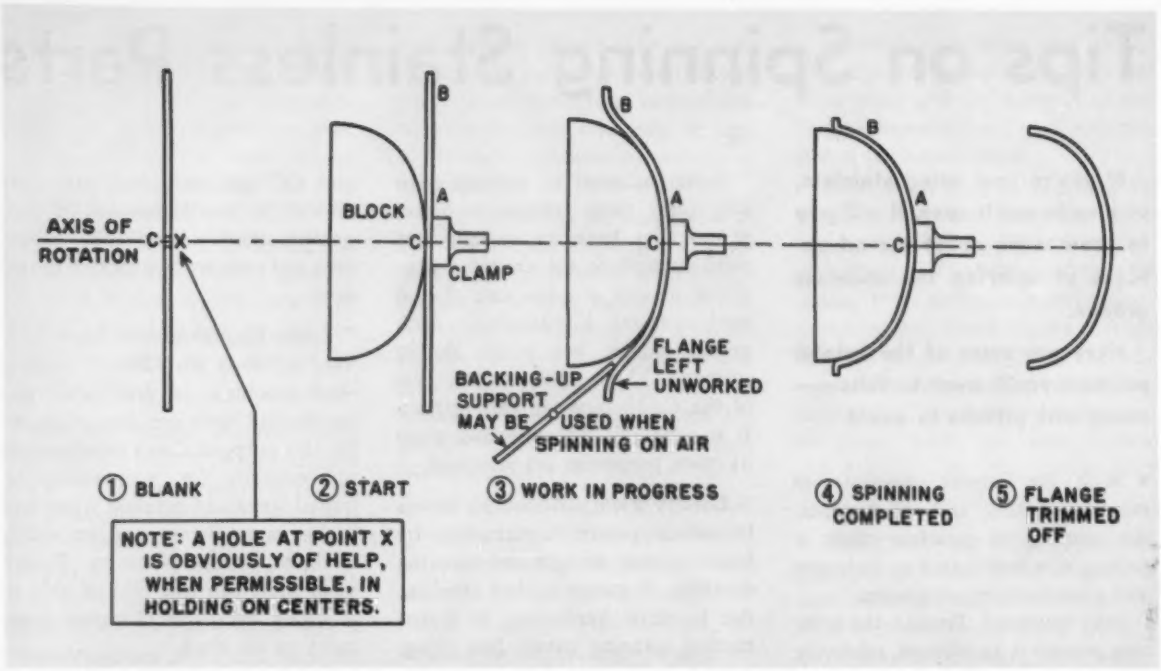
Lowers Yield—Annealing serves to reduce power requirements by lowering yield strength and restoring ductility. It guards against cracking due to strain hardening. It makes manual spinning easier, less tiring, helps to reduce metal springback.

In the annealed condition, the straight chromium grades—Types 405, 410, and 430—have properties and cold-working characteristics quite similar to those of carbon steel. They do not harden continuously under cold working. Grades with higher chromium content (17 pct and over) are more difficult to handle because of their greater tendency towards brittleness and comparative lack of toughness.

Lathe Requirements—Most spinning is done on lathes. Vertical shaft machines of drill press and boring mill types are also adaptable for this purpose. Chief requirements are capacity for maintaining required speeds of rotation when tool pressures are heavy and an ability to do so without vibration. Equipment must run true and be able to maintain adequate clamping pressures on the work.

Spinning blocks are used to form the metal to a given contour. These blocks are made of hard wood, carbon steel, cast iron, or wood that has been reinforced with steel. For dimensional accuracy, steel and steel-reinforced wood are preferred. With less severe tolerances, lighter forming loads, or short production

STARTING DISK: Compression spinning forms a stainless steel disk at The DeLaval Steam Turbine Co.



STEP-BY-STEP: Successive steps in manual spinning show the spreading or folding action that characterizes the process. Stainless Types 405, 410, and 430 readily lend themselves to manual spinning.

runs, the other blocking materials are considered acceptable.

Designed in Segments—Spinning blocks are sometimes made up in series for a given job. One or more blocks may be used for "rough" forming, with a final block for the finishing operation. External forms for internal spinning often have to be of segmental design to permit easy removal.

Spinning tools are of round nose or roller type. The shanks on which they are mounted serve as levers for generating high pressures and must be of strong, non-bending design (particularly under compound leverage).

Tool Types—Round nose tools must have smooth bearing surfaces to prevent damage to workpieces. Shapes vary with the contour of the work. Wide bearing surfaces spread the pressure and decrease its intensity. Small surfaces concentrate it.

Roller type tools reduce frictional drag and effectively concentrate applied pressure. They are especially suitable for roughing-down purposes. Rollers are made of hardened and polished steel and should be mounted so as to be free and true running.

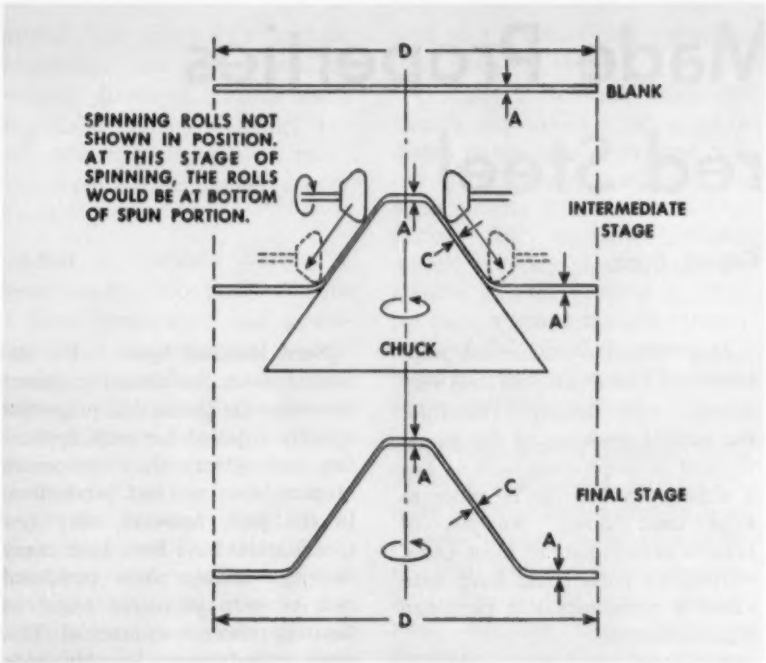
In making blanks for manual spinning, be sure they are of true circular shape and flat. They should be of uniform thickness, clean, and free of burrs and edge defects. Proper mechanical properties and uniform surface finish are also important. If blanks are of diameters that require a splicing weld, make sure the weld seam is dressed off flush with the base metal on both sides before clamping the piece into spinning position.

Sizing Blanks—In manual spinning, thickness reduction is usually negligible. Under these conditions, blank sizes can be determined by the equivalent area method. This means simply that the surface area of the blank should closely approximate that of the finished part. Such calculations should always be checked by running test samples in advance of production.

Manual spinning obviously requires skill that can be acquired only through training and experience. It always requires adequate power—more power than is needed to form softer materials such as mild steel, copper, and aluminum. Forming the metal results in a temperature rise and some degree of expansion. The contraction that occurs upon cooling must be allowed for when establishing dimensional tolerances.

Determining Speeds—Speeds for manually spinning stainless depend on a number of factors such as size, intricacy of shape, and metal composition. As a rule-of-thumb, speeds for Cr-Ni grades (other than Type 305) will be about ⅓ to ½ those suitable for carbon steel. For the spinnable straight chromium grades and Type 305, figure on ½ to ¾ the speeds used with carbon steel.

Lubrication is essential to protect both tools and work surfaces. Ordinary laundry soap thickly applied is satisfactory for a wide range of work. Other lubricants are lard oil, paraffin, and mixtures of soap and grease. Heavy-bodied, oil-base lubricants may be required for severe work.



COMPRESSION: Diagrammatic sketch outlines stages of compression spinning. "D" diameter doesn't change.

Limit Thickness — The thicknesses and diameters of blanks that can be handled in manual spinning are limited mainly by the capacity of the equipment. As a general rule, thicknesses are limited to a maximum of about 0.125 to 0.140 in. and to a minimum of about 0.015 in. on small work. Diameters in a range of about 90 to 102 in. represent the usual maximum.

In compression spinning, a circular blank is firmly secured at its center to a cone-shaped form block. The assembly is placed in rotation about its center line. One or more small diameter work rolls are mechanically directed onto the rotating blank to provide sufficiently high compression to cause a reduction in the thickness of the material as it rotates. The work roll advances in direction parallel to the block surface, resulting in a squeezing pressure.

Like Rolling — The control of area extension to produce desired shapes by this compression method lies in the extent of thickness reduction and in the shape of the spinning block. The block may be compared to the bottom roll of a two-high rolling mill in which the small diameter spinning roll is substituted for the upper roll.

Forming depends on how the work metal reacts to compression and resultant extrusion. It can be assumed that any of the stainless steels that can be flat-rolled can also be spun by this method.

The various grades of stainless behave in spinning pretty much as they do in cold-rolling. The Cr-Ni compositions tend to work harden. The straight chromium grades strain harden at their usual rates. This hardening is not critical simply because the entire forming job is completed in a single operation.

Must Be Rigid—Equipment used for compression spinning may be of single-purpose or multi-purpose design. Because of the high pressures involved and the need for close tolerances, equipment must be extremely rigid and free of vibration.

In calculating blank size for compression spinning, there are a few simple rules to remember. The diameter of a blank required for spinning a cone with a flat top and a flat bottom flange is always the same as the outside diameter of the flange of the spun part prior to any final trimming. Actually, the metal composing the flange remains unworked during spinning.

Uses Trig—Blank thickness depends upon the metal thickness that must be provided in the worked portions. This refers to the sloping straight sides. It varies with the angle of the cone and can be determined by graphic layout or by trigonometry.

If you wish to use the trigonometric approach, follow this simple formula: the required blank thickness is equal to the specified wall thickness divided by the cosine of the cone angle.

Compression spinning has many advantages, not the least of which is its ability to accurately maintain final wall thickness. Also, it can produce conical shapes that are of initial stock thickness at their centers and of uniformly reduced thickness in their sides. Conical shapes can be turned out in a single operation as against multiple drawing operations.

Many Advantages—Still another advantage stems from the fact that thickness reduction is obtained by compression rolling. This may make it possible to specify material thicknesses that command a lower price per pound. Best of all, compression spinning is well adapted to quantity production. Still, it can profitably handle smaller quantities where die costs would be hard to justify.

To achieve certain shapes, it is sometimes desirable to incorporate both spinning and drawing in production sequences. Such combinations are always determined by visualization of metal flow. A typical example is the round-cornered, rectangular television cone.

ACKNOWLEDGMENT: The editors would like to thank the Allegheny Ludlum Steel Corp. for the information and illustrations contained in this article.

Get Tailor-Made Properties With Sintered Steel

By **Robert Talmage**—Consultant, New Canaan, Conn.

Powder metallurgy has grown —some five million sintered parts are being made daily. But where does its real potential lie?

It'll produce properties akin to those of wrought metals, and some unique ones of its own.

Gaining these benefits takes a special approach to design.

▪ Powder metallurgy introduces some totally new concepts to the metallurgical world, so different that many engineers even now don't understand their great importance. There's still a marked suspicion that anything made from metal powder can't be strong or consistently uniform. Actually, the process probably can produce stronger and more uniform metal than is possible with liquid metallurgy—tensile strengths on the order of 500,000 psi.

Also, a recent development in aluminum powder metallurgy known as SAP provides better physical properties at high temperatures than similar products of liquid aluminum metallurgy. Moreover, sintered products such as tungsten carbide, porous metal filters, porous bearings and metallic friction materials are greatly expanding the usefulness of metals to industry.

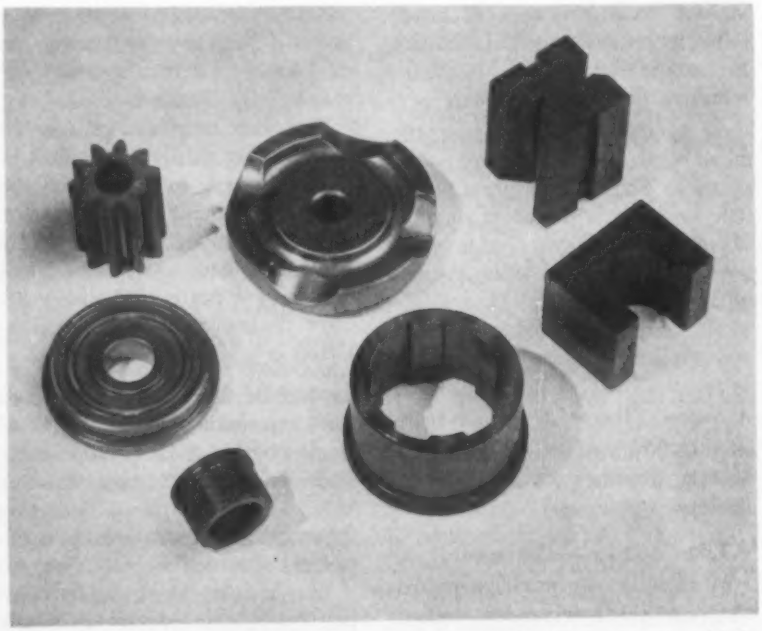
Economics Decide—So the decision as to whether a part should be made from steel produced in a melting furnace or in a sintering furnace is really just one of economics and not physical properties. Economics is also a major factor in the choice of materials and method for making sintered steel parts, and this is another reason why weak parts may be made.

In general, the mechanical properties and cost of sintered steel vary directly with density. Therefore, the natural tendency of the manufacturer is to produce with as low a density as feasible in order to keep costs down. Analysis of failures shows that, in most cases, satisfactory parts could have been made if economics had permitted higher strengths.

Experience on countless different applications has shown that powder metallurgy can always save money if the part can be processed in only one pressing and sintering. Even on simple shapes such as plain washers, costs can be lower than for a stamped counterpart if the stamping requires chamfers, smooth surfaces, or burr-free corners.

Need Detailed Specs — It's important, then, that design engineers determine the mechanical properties actually required for each application and specify these properties in parts for test and production. In the past, however, very few specifications have been used; many drawings merely show powdered iron or even powdered metal as the only reference to material. This gives manufacturers a very wide latitude in their choice of materials and methods. And the cost factor usually prevails, especially when quotations must be competitive.

Many people also fail to realize the vital importance of the sintering operation. Sintering is the heart of the process, not just another heat-treating job. Strong steel can be made from any standard com-



MANY USES: Properly designed and made, sintered metal parts will be strong and uniform, able to do the toughest kinds of jobs.

mercial iron powder without briquetting, but never without sintering. If proper controls aren't maintained during sintering, the very best briquette will be weak, even though material and density are very good.

Effect of Variables — Fig. 1 shows how the three basic variables of time, temperature and atmosphere affect the strength of average density, plain carbon sintered steel parts. The 0.1 pct C material was obtained by sintering a 5.9 density MPA tensile bar briquette of standard reduced iron powder, with 1 pct zinc stearate added as a lubricant. The 0.7 pct C material was exactly the same, except that 1 pct of fine graphite powder was added to the powder mixture, and the additional combined carbon was obtained by diffusion during sintering.

Most continous-production sintering furnaces allow only about 10 minutes of actual time at a maximum temperature on the work of about 2025°F, even though parts are in the hot zone for a somewhat longer period. For purposes of this illustration these conditions are used as a standard, and variations from them are shown.

It's easy to see how much difference the addition of graphite makes in tensile strength, and how important sintering conditions are when alloying by diffusion is done during that operation. Under normal sintering conditions of ten minutes at 2025°F, there is a 300 pct gain in tensile strength between 0.1 and 0.7 pct C content, compared to a gain of about 100 pct in equivalent wrought steels.

Big Change With Graphite—This example also shows how much more sensitive tensile strength is to time and temperature when graphite is added. Rather wide changes have little effect on low carbon sintered steel; but the same range of temperatures and times can produce great changes on those with graphite added.

Good atmosphere conditions are also important—one of the most common problems in sintering is to maintain a high carbon potential atmosphere. If excessive decarburization takes place, tensile strength will be reduced to something like that shown for 0.1 pct C. This removes most of the advantage of graphite additions.

Proper selection of raw materials for alloying additions plays a vital role in making high strength parts. There is, for instance, a wide choice of grades and types of graphite which can be used, but only a few will do a good job. In general, best results are obtained with better quality graphite powders.

Can Vary Density—The second basic consideration, density, is controlled by the briquetting operation. Since density and its counterpart, porosity, can be varied by the amount of pressure applied during briquetting, it provides a distinct advantage which can't be attained with cast steel. Too often, however, porosity is looked on as a necessary evil that should be eliminated if possible.

The fact that a porous structure can be impregnated with a variety of metallic and non-metallic materials offers many new approaches to problems such as wear, noise, weight, heat and conductivity. For instance, hardened steel impregnated with lubricating oil reduces wear of roller chains by as much as

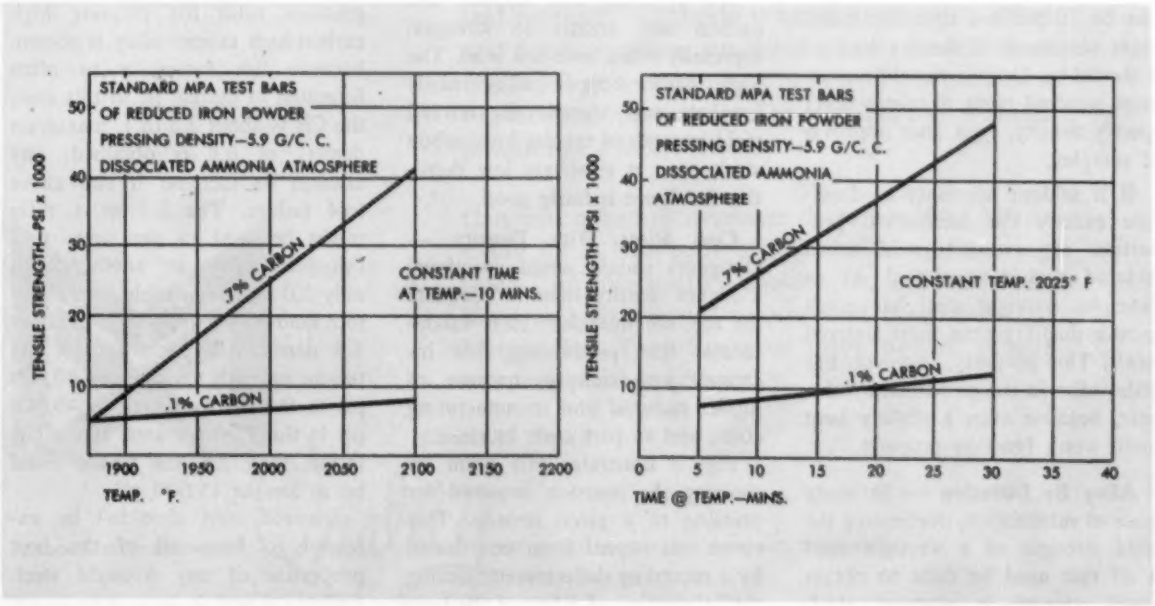


FIG. 1: Tensile strength of sintered steel is sensitive to both time and temperature, becomes even more so when carbon is increased by additions of graphite. Good atmosphere conditions are also important.

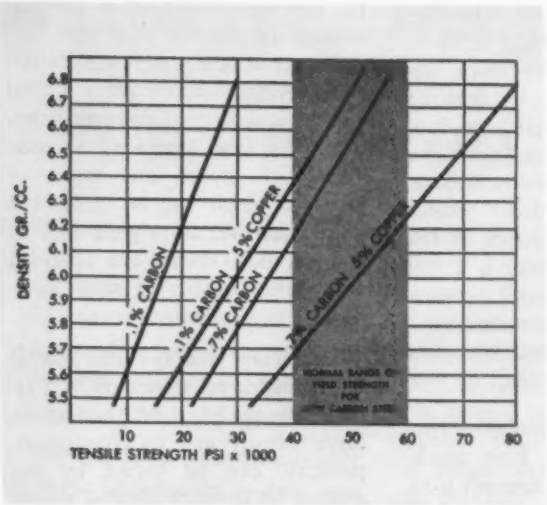


FIG. 2: Carbon and copper diffuse quickly and uniformly into iron at normal sintering temperatures, making it easy to create special alloys.

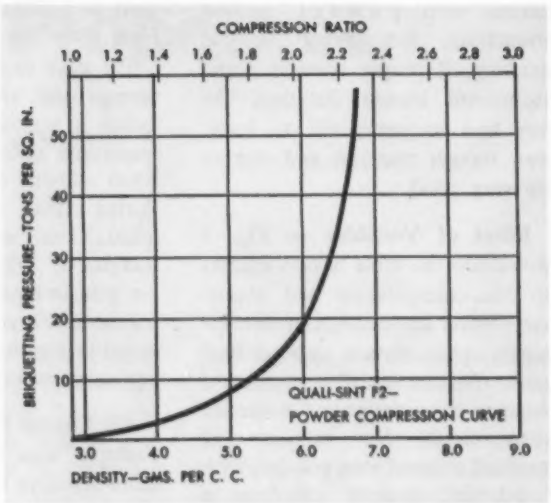


FIG. 3: As density goes up, so does cost, mainly because the much higher pressures needed for briquetting call for expensive presses and tooling.

80 pct. Impregnation with viscous materials increases resonant damping qualities to reduce noise and fatigue. Porosity also permits many new combinations, such as 30 pct lead steel or 30 pct copper steel.

Affects Strength—Density has a tremendous effect on the strength of sintered steel. Its influence is so great that, even under the best of sintering conditions, tensile strength can be 70 pct less than the maximum obtainable if density isn't as it should be. Despite this difference, most sintered parts drawings don't specify density, even after approval of samples.

It is seldom necessary to duplicate exactly the mechanical properties of wrought steel when sintered steel is substituted. As an example, wrought steel has much greater ductility than most sintered steels. This property, however, has little value in the performance of a gear, because even a slightly bent tooth won't function properly.

Alloy By Diffusion — In many cases of substitution, duplicating the yield strength of a wrought steel is all that need be done to obtain equal strength in sintered steel. This is easy with just the basic operations, because carbon and copper alloys very quickly and uniformly diffuse into iron at normal sintering temperatures. The resulting high carbon-copper alloy is relatively unknown in liquid metallurgy, so designers often overlook its advantages.

To illustrate the strength of this relatively new alloy, Fig. 2 compares density and tensile strength of four related materials.

It's apparent that copper and carbon add greatly to strength, especially when both are used. The high carbon-copper alloy easily brackets and exceeds the normal yield strength of regular low-carbon steel; even at relatively low densities the figure is fairly good.

Cost Rises With Density — Designers should avoid specifying a higher density than is adequate for the use intended. It is fundamental that production cost increases with density, because of higher material and manufacturing costs, and so part costs increase.

Fig. 3 illustrates this point by showing the pressure required for pressing to a given density. This curve was copied from one drawn by a recording deflectometer during the briquetting of a bar of the high carbon-copper alloy in a compression-test machine.

It also shows why it isn't possible to obtain a density of more than about 6.8 with this particular powder mixture. Any pressure beyond about 55 tons per sq in. doesn't accomplish any further compression, but does call for special approaches in tooling and pressing. The result is higher tool costs, greater tool wear and maintenance.

CR is a Factor — The compression ratio for pressing high carbon-high copper alloy is shown, because this factor is so often forgotten in design. If, in this case, the CR is about 2.3 to 1, maximum density of 6.8 is obtained; any attempt to increase it can cause tool failure. The 2.3 to 1 ratio might be used in one area of a briquette while in another area only 2.0 to 1 is possible because of tool limitations; this results in about 5.8 density. In such a case, the tensile strength varies from 80,000 psi in the 2.3 to 1 area to 40,000 psi in the 2.0 to 1 area. If the CR is less than 1.8, the tensile could be as low as 15,000 psi.

Sintered steel shouldn't be expected to have all of the best properties of any wrought steel. Rather, regard it as a way to get many new properties which can help solve metallurgical problems.

A MOMENT WITH MANAGEMENT...

HERE'S HOW: The Production Manager can Increase the Profit Margin!

No one consciously cuts profits by spending man-hours and machine time on materials headed for the scrap heap. This is something that "just happens."

Testing is one of the best new tools for the production man—a low-cost way of preventing waste. Early detection of all parts headed for the scrap heap enables you to take corrective action *before* additional machining costs are invested.

Such testing is a new tool that offers immediate savings and future savings as well.

At a cost of only a few hundred dollars, many plants (large and small) now save thousands of dollars per month.

Magnaflux provides these tools. Effective, low-cost test methods eliminate wasted production effort and permit holding consistent quality standards at any level you establish. These benefits provide a higher profit percentage. Or, if you prefer, a better product at a lower price.

Can you afford to overlook these benefits? Write today for a free copy of "Lower Manufacturing Costs," an informative booklet. Or, ask our Field Engineer to discuss where and how low-cost Magnaflux Test Systems have helped others increase plant productivity.

The Hallmark of *Quality* in nondestructive test systems

MAGNAFLUX CORPORATION • 7302 W. Lawrence Avenue, Chicago 31, Illinois

RED CIRCLE
Rolls
ALLOY-CHILLED
Hyde Park
Rolling Mill Equipment
For more than 50 years Hyde Park Steel Mill equipment has been helping American industry lead the world — equipment such as—
• Bar Mills
• Merchant Mills
• Sheet and Strip Mills
• Pinion Stands
• Roller Tables
• Reduction Drives
• Stretcher Levellers
• Guillotine Shears
• Sheet Mill Shears
• Roll Lathes
• Special Machinery
• Machine Work
For finer finish, long life and greater tonnage, specify Red Circle Rolls.
Hyde Park
FOUNDRY & MACHINE CO.
Hyde Park, Westmoreland Co., Pa.
ROLLS
ROLLING MILL MACHINERY
GRAY IRON CASTINGS

FREE TECHNICAL LITERATURE

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 113.

Steel Castings

You can take a trip through a metal castings firm via a new 18-page booklet. It conducts a picture tour of one company's foundry and other plant facilities for producing and working stainless, carbon and alloy steel castings. (Empire Steel Castings, Inc.)

For free copy circle No. 1 on postcard, p. 113

Materials Handlers

Manual and dragline carts are illustrated in a 4-page brochure. These carts can be "custom" built from standard components on order. (Safety Industries, Inc.)

For free copy circle No. 2 on postcard, p. 113

Diaphragm Pumps

A manufacturing engineer of chemical instrumentation systems has just issued a bulletin on a metering pump with a diaphragm liquid end. The leakproof pump meters corrosive, obnoxious or toxic chemicals. (Milton Roy Co.)

For free copy circle No. 3 on postcard, p. 113

Power Saws

Fast, accurate cutting of metal is done by gyro balanced power saws described in an 8-page folder. These pushbutton controlled, circular blade machine tools work at high production speeds while giving micro-accuracy. They handle cut-off and meter work, bevel and rip cuts, even precise shaping operations. (DeWalt Div., American Machine & Foundry Co.)

For free copy circle No. 4 on postcard, p. 113

Marking Stick

A catalog describes a marker for any type metal whose markings withstand 2400°F. It serves heat treating, normalizing, annealing or buttweld tube marking. (Markal Co.)

For free copy circle No. 5 on postcard, p. 113

No-corrode Coating

A coating which gives mild steel considerable resistance to corrosion, abrasion and chemical action is described in a 4-page folder. Listed as key features of mild steel coated with the material are: (1) protection; (2) abrasion resistance; (3) versatility; (4) ductility; (5) weldability. (Tube Reducing Corp.)

For free copy circle No. 6 on postcard, p. 113

Limit Switches

Small, two-circuit limit switches which handle loads usually assigned much bigger switches are outlined in a 4-page bulletin. Measuring less than 5-in. high, they rate at 10 amp, 120, 240 or 480-v alternating current. (Micro Switch Div., Minneapolis-Honeywell Regulator Co.)

For free copy circle No. 7 on postcard, p. 113

Engineer Consultants

Consulting engineers introduced in a brochure specialize in various

metalworking problems (i.e., automation, metal curtain wall design, industrial building design). Electrical transmission and distribution systems for industrial plants is another service offered. (Clauer Associates.)

For free copy circle No. 8 on postcard, p. 113

Furnaces

Electric salt bath furnaces get the complete treatment in an attractive and comprehensive 72-page booklet. Easy to follow and understand, the booklet contains 32 pages on applications alone—from aluminizing to tempering. Advantages, construction, accessories and much more is fully covered. (Ajax Electric Co.)

For free copy circle No. 9 on postcard, p. 113

Throw-away Tools

Throw-away insert holders are covered in three technical bulletins. They offer data on a family of tool holders, each of which uses 55° diamond shaped throwaway inserts. (Wesson Co.)

For free copy circle No. 10 on postcard, p. 113

Expanded Metals

Expanded metal and grating uses are discussed in a bulletin. Four new patterns appear for the first time. Expanded metal comes in carbon and stainless steels and aluminum. (Joseph T. Ryerson & Son., Inc.)

For free copy circle No. 11 on postcard, p. 113

Flow Meters

Engineering data on differential pressure type flow meters is supplied in a 22-page booklet. It contains basic selection, sizing and installation information of meters for gases, liquids and steam. (The Bristol Co.)

For free copy circle No. 12 on postcard, p. 113

Settling Tank

For removing solids from water and industrial waste, a new settling tank is described in an 8-page folder. Tanks feature: (1) uniform influent distribution across the tank;

CASH TIED UP IN INVENTORY?

then release it through LAWRENCE SYSTEM

Your inventory is prime collateral . . . and Lawrence specializes in providing inventory financing right on your own premises — quickly and economically! For full details call our nearest office collect or send the coupon.

Without obligation please send me your brochure, Golden Catalyst.

Name_____

Firm Name_____

Address_____

Lawrence on Warehouse Receipts . . . is like Certified on Checks

LAWRENCE SYSTEM

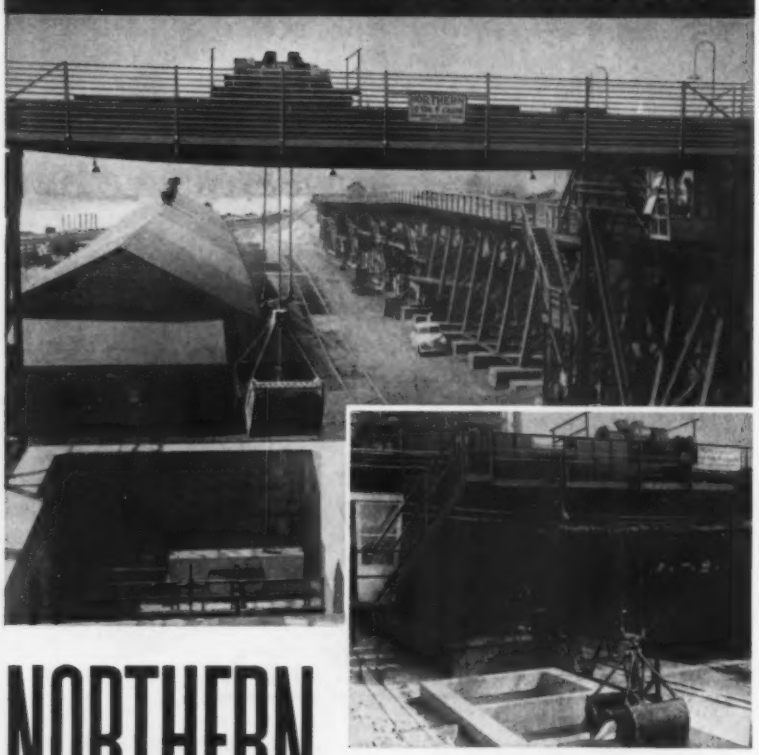
LAWRENCE WAREHOUSE COMPANY

NATIONWIDE FIELD WAREHOUSING

37 Drumm Street, San Francisco, California
100 N. La Salle Street, Chicago 2, Illinois
79 Wall Street, New York 5, New York

OFFICES IN ALL PRINCIPAL CITIES

Look Overhead . . . see "NORTHERN"



NORTHERN YARD CRANES

are built for rugged service

All Northern Overhead Electric Traveling Cranes are designed and built to provide the maximum in dependable operation under the most rugged conditions.

High efficiency and minimum maintenance are assured by close tolerance machining of all mechanical parts with turned and ground shafts, press fits of gears, wheels and bearings. Brakes are chosen to allow for extreme overload conditions. Extra heavy structural sections and rigid construction of girders with end trucks insure lateral stiffness, minimum vertical deflection and safe operation when the crane travels at full speed. Heavy duty type motors with anti-friction bearings are combined with especially selected control equipment to assure fine handling.

In plants where bulk material handling is required, as in the steel plant shown above, Northern cranes are a preferred investment for safety, dependability and efficiency.

Write for Bulletin SE-108

MATERIAL HANDLING EQUIPMENT BY NORTHERN

NORTHERN ENGINEERING WORKS
210 CHENE ST., DETROIT 7, MICH.

FREE LITERATURE

(2) uniform flow throughout the entire tank length; (3) uniform effluent discharge from the surface. (Link-Belt Co.)

For free copy circle No. 13 on postcard, p. 113

Welding, Heating

A catalog sheet tells how one maker's high-alumina ceramic custom shapes act as insulators, locators, guides and supports for induction heating, welding and brazing applications. (Diamonite Products Mfg. Co.)

For free copy circle No. 14 on postcard, p. 113

No-corrode Cements

Five standard corrosion-proof cements, each for a different resistance problem, are described in a 12-page brochure. These cements are used to join various bricks and tiles. Cements are unaffected by acids, alkalies, solvents, greases, detergents or salts. (Atlas Mineral Products Co.)

For free copy circle No. 15 on postcard, p. 113

Die Handler

Equipped with special attachments, a narrow-aisle electric truck can simplify die-handling operations. An on-the-job study report tells how a common die-handling problem was solved by using such equipment. (The Raymond Corp.)

For free copy circle No. 16 on postcard, p. 113

Diaphragm Seals

Diaphragm seals designed to protect pressure instruments against corrosion and clogging are described in a bulletin. (Brooks Rotameter Co.)

For free copy circle No. 17 on postcard, p. 113

Microphotometer

A microphotometer covered in a 4-page data sheet measures photographic densities of exposed spectrographic and x-ray plates. (Leeds & Northrup Co.)

For free copy circle No. 18 on postcard, p. 113

Giant
126-ton crankshaft
checked for
soundness
by...

ULTRASONIC TESTING

This huge crankshaft is vital to the operation of a steel plant blooming mill. Its importance cannot be overstated. Failure of the shaft under the tremendous stresses involved would wreck the 25,000 hp steam engine that drives it, and cripple production for the plant.

Dangerous internal defects must not be permitted to develop and early detection is essential. Ultrasonic inspection does the job efficiently, accurately and with the greatest reliability, giving the plant high assurance on the safety factor of this costly equipment.

REFLECTOSCOPE CUTS REJECTS IN AUTOMOTIVE TRANSMISSION SHAFT PRODUCTION

Of smaller size, but equally important, is the ultrasonic inspection of automotive transmission shaft forgings. Sperry Reflectoscopes locate hidden flaws at an early production stage, preventing costly rejects and minimizing the potential dangers of failure in customer use.

An invaluable inspection tool, the Reflectoscope has thousands of applications, ranging through quality control, periodic maintenance, laboratory testing, automatic inspection on high-speed production lines, etc. Equally efficient in contact or immersion use, it provides a quick and economical technique for detecting hidden flaws.

If you're interested in saving man-hours and material, send today for details of the Sperry Ultrasonic Reflectoscope. Just fill out and mail the coupon.

Sperry

SPERRY PRODUCTS, INC.
Danbury, Conn.
First in Ultrasonic Inspection

Sperry Products, Inc., 304 Shelter Rock Road, Danbury, Conn.

☐ Send me the Ultrasonic News Letter

☐ Send me Reflectoscope Information

NAME_____ TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____

Introducing Allied's

IRILAC™ #1000

New Clear Protective Coating for All Metals . . . as safe and easy to handle as Water!

New method of protection incorporates corrosion inhibitors in a water-soluble polymer base. Dries to an extremely thin, tough, durable coating—clear in color. Does not chemically affect base metal or any post-treatments. Used as a protective treatment alone or to enhance value of post-treatments.

Allied's new Irilac #1000 is a concentrated solution of a water-soluble polymer with built-in complex corrosion inhibiting materials. It was developed to answer the needs of the metalworking industry for a non-conversion process that will provide corrosion resistance and resistance to fingerprinting and abrasion on base metals and electrochemically or chemically finished surfaces—without changing the appearance of the metallic surface.

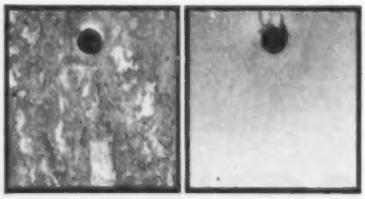
There are no hazards involved—Irilac is non-fuming, non-toxic, and requires no special fire prevention measures.

THE PROCESS

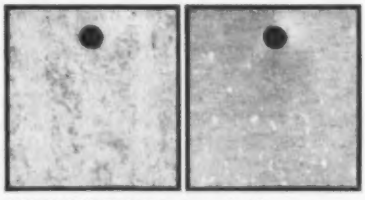
Irilac #1000 is diluted with water to provide a simple one-pass working solution. It is then applied by dip, brush or spray and forms a coating that quickly *bonds* to the metal surface without reacting with the surface.

THE PROPERTIES

The resulting coating is clear, transparent, thin yet durable. It has excellent water-resistant properties, and can be rubbed, handled and subjected to rough treatment. The surface to which Irilac has been applied is not altered—in fact, the transparent coating brings full tone to colored surfaces and clarity to iridescent surfaces. The water-thin physical characteristic of the solution means that the coating provides protection in recessed areas that are difficult, if not impossible, to protect with other methods.



STEEL PANELS: bare (left) and coated with Irilac (right) after 8-hour salt spray.



ALUMINUM PANELS: bare (left) and coated with Irilac (right) after 168-hour salt spray.

WHERE IRILAC CAN BE USED

Irilac #1000 can be applied to *any* metal—wet or dry—treated or untreated. All metals can be processed in *one* operation in the same solution. It can be applied in conjunction with any process—over Iridite, anodized, phosphated surfaces, black oxide, etc. Surfaces treated with Irilac provide a good base for paint.

APPLICATION ADVANTAGES

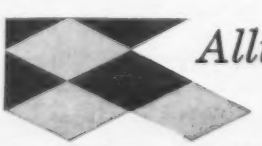
No other process or material available for the protection of metals offers all the application advantages found in new Irilac #1000:

1. It can be applied to *any* clean metal simply by dip, brush or spray. No special equipment is required.
2. Saves time—just apply and dry—no reaction time required.
3. No hazards involved—no exhaust or special fire protection equipment is required. Irilac is non-fuming and non-toxic.
4. Saves space. Presents no disposal problem. Low in first and final costs.

Because of its versatility and complete safety, Irilac has unlimited uses. For example, it will protect aluminum furniture, brass hardware and fixtures, steel parts of all types, zinc castings, etc. In fact, any base metal or plated surface, or those treated with electrolytic or chemical post-treatments, can be improved or enhanced with Irilac.

IRILAC #1000 MAY BE THE ANSWER TO YOUR PROTECTION PROBLEM

Our development staff will be glad to work with you to determine the significant benefits Irilac can offer you. Simply send us some parts and let us show you what Irilac can do. No obligation, of course.



Allied Research Products, Inc.

4004-06 EAST MONUMENT STREET
BALTIMORE 5, MARYLAND

***Manufacturers of* IRIDITE®, IRILAC™, ARP® Brighteners and Plating Chemicals**
West Coast Licensee: L. H. Butcher Co.

FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Tooling Blocks

Lightweight magnesium and aluminum height blocks described in new literature speed tooling and patternmaking operations through easier handling. Blocks come in 5, 10, 15 and 20-in. standard heights. Tops are 8 in. square. Faces are accurate to 0.0001 in. (The Challenge Machinery Co.)

For free copy circle No. 21 on postcard

Pyrometers

Indicating-controlling pyrometers are featured in a 6-page bulletin. Simple design lets these very compact instruments occupy comparatively little panel space—less than ⅓ sq ft. (Illinois Testing Laboratories, Inc.)

For free copy circle No. 22 on postcard

Turntables

Manually operated, bearing mounted turntables are described in a 4-page catalog. These come in standard 36 to 96 in. diameters. Of welded steel construction, they also come in 16-ft diam, 30-ton capacity powered types. (Atlas Car & Mfg. Co.)

For free copy circle No. 23 on postcard

pH Equipment

Industrial pH equipment is covered in an 8-page brochure. (Beckman Process Instruments Div.)

For free copy circle No. 24 on postcard

Load Control

Control of feed devices on crushing and grinding machines is provided by a load control unit. For example, it allows stopping (or slowing down) of a feed conveyor when a crusher gets loaded to a desired limit. It also permits automatic restarting when load is reduced. A catalog section gives details. (Machinery Electrification, Inc.)

For free copy circle No. 25 on postcard

Tumbling Media

An envelope-size folder lists current lines of tumbling media. It gives descriptions, specifications and prices of media for various barrel finishing jobs. (Electro - Minerals Div., The Carborundum Co.)

For free copy circle No. 26 on postcard

Conveyor Furnace

Inclined-hood conveyor furnaces are featured in a 4-page bulletin. Models feature automatic, economical operation; they have variable speed electronic drive, escalator-type auxiliary drive. Temperature control is automatic. Large heating chambers are a key feature. (C. I. Hayes, Inc.)

For free copy circle No. 27 on postcard

Tank Lining

Acid-proof tank lining material is described in an 8-page bulletin. This lining comes in flexible sheet form. (Maurice Knight Co.)

For free copy circle No. 28 on postcard

Internal grinding

Efficient, economical internal grinding is promised for a series of grinding wheels in a pamphlet. Finishing holes to ±0.0005-in. tolerances and better, these wheels reduce secondary lapping time by giving an original fine finish. (Peninsular Grinding Wheel Sales Corp.)

For free copy circle No. 29 on postcard

Worm Gearing

Debunking a popular misconception that double-enveloping worm gearing is difficult to assemble is a new 8-page bulletin. It shows how to adjust a set of such gears accurately with no more than a set

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **4/3/58**

Circle numbers for Free Technical Literature or Information on New Equipment:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70

If you want more details on products advertised in this issue fill in below:

Page .....Product .....

Page .....Product .....

Page .....Product .....

PLEASE TYPE OR PRINT

Your Name .....

Title .....

Company .....

Co. Address .....

City ..... Zone .....

State .....

FIRST CLASS PERMIT No. 36 New York, N. Y.

BUSINESS REPLY CARD

No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE

Post Office Box 77
Village Station
NEW YORK 14 N. Y.

BUSINESS REPLY CARD

No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE

Post Office Box 77

Village Station

NEW YORK 14, N. Y.

FIRST CLASS PERMIT No. 36 New York, N. Y.

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **4/3/58**

Circle numbers for Free Technical Literature or Information on New Equipment:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70

If you want more details on products advertised in this issue fill in below:

Page .....Product .....

Page .....Product .....

Page .....Product .....

PLEASE TYPE OR PRINT

.....

Your Name

.....

Title

.....

Company

.....

Co. Address

.....

City Zone

.....

State

FREE LITERATURE

of feeler gages, or a dial indicator. (Cone-Drive Gears Div., Michigan Tool Co.)

For free copy circle No. 30 on postcard

Shock Controllers

Vibration, shock and noise can be reduced considerably by mounting your machines on steel spring mountings, says a new catalog. Eight typical case histories supply anti-vibration ideas. (The Korfund Co., Inc.)

For free copy circle No. 31 on postcard

Teflon Products

Glass-supported Teflon products are dealt with in an 8-page brochure. Covered are: sheets, tapes, laminates, metal-clads, and fabricated parts. (Continental-Diamond Fibre Corp.)

For free copy circle No. 32 on postcard

Numerical Controls

Application data for numerical positioning controls appears in a 14-page brochure. Controls fit a number of machines. (General Electric Co.)

For free copy circle No. 33 on postcard

Silicone Rubber

Class 900 silicone rubber for wire and cable insulation resists heat, doesn't absorb moisture. A 4-page bulletin discusses applications, thermal and electrical conductivity. (Silicone Products Dept., General Electric Co.)

For free copy circle No. 34 on postcard

Lock Fasteners

Lock nuts and fasteners are reviewed in a 28-page catalog. Also covered: high-speed wrenches. (The Palnut Co.)

For free copy circle No. 35 on postcard

Photometer

A 6-page bulletin introduces an absolute light-scattering photometer. This permits studies of high-molecular-weight compounds. It also figures particle sizes in the micron and sub-micron ranges. The instrument measures turbidity, dissymmetry, depolarization and angular scattering. (American Instrument Co.)

For free copy circle No. 36 on postcard

Electrical Brake

Electrical brakes' applications are discussed in an 8-page bulletin. They work on ac or dc. (General Electric Co.)

For free copy circle No. 37 on postcard

Pull Pins

Single-action pull type locking-unlocking pins are covered in a data sheet. (D. W. Price Corp.)

For free copy circle No. 38 on postcard

Power Unit

New literature covers an all-new, all alternating current adjustable speed drive. It uses an ac power supply, an operator's control station, and an ac motor. (The Electric Products Co.)

For free copy circle No. 39 on postcard

Balancing Machines

New electro dynamic balancing machines are detailed in a 10-page bulletin. This unit sets up easily for production or small (or mixed) lot runs. (Tinius Olsen Testing Machine Co.)

For free copy circle No. 40 on postcard

Lift Truck Design

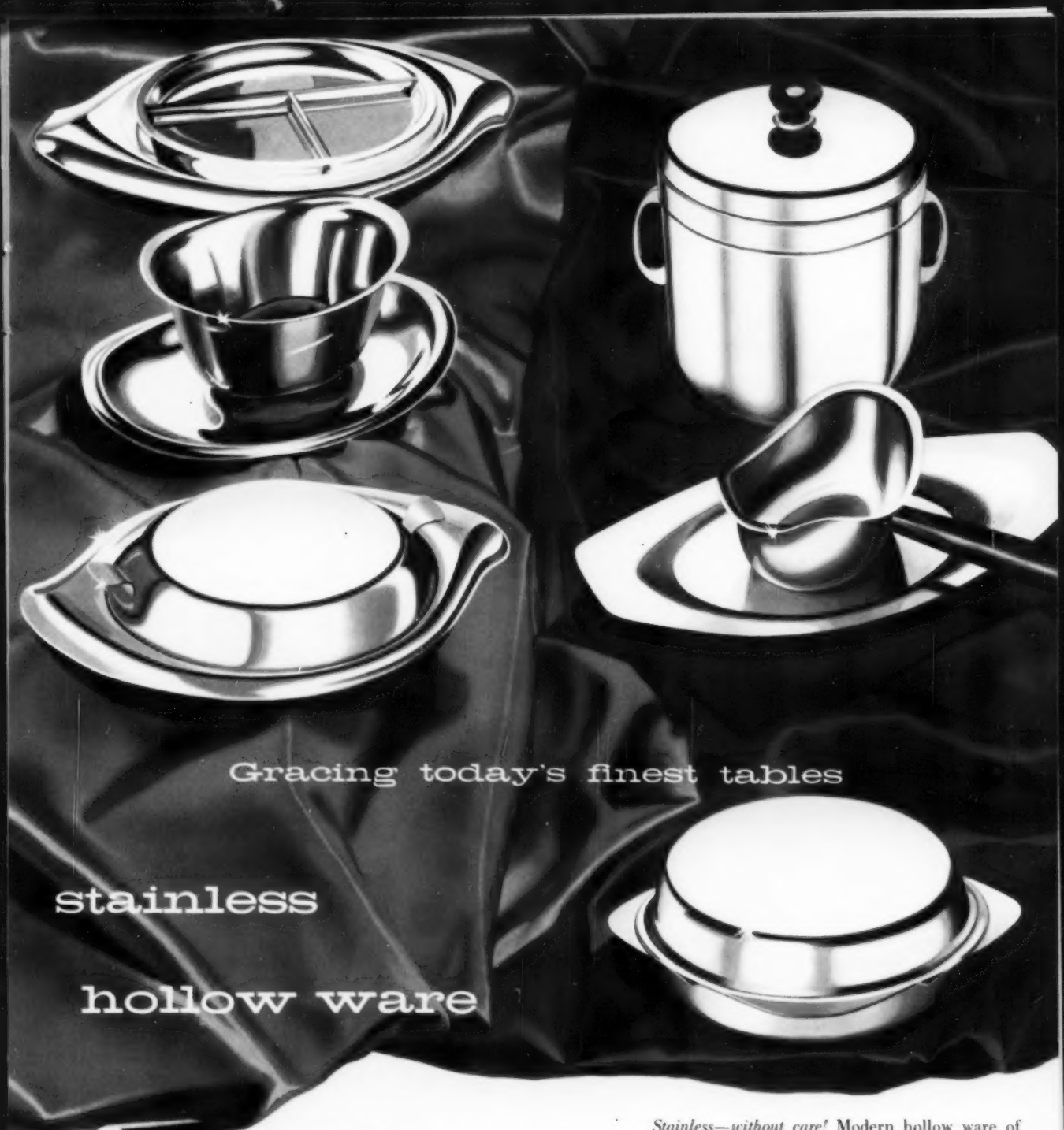
Behind - the - scenes accounts of many engineering principles involved in making a modern fork lift truck are contained in a brochure. It also gives a close design analysis of individual components that go into the finished truck. (Towmotor Corp.)

For fre copy circle No. 41 on postcard

Spectrochemical Unit

A high precision source unit is described in a bulletin. (Applied Research Laboratories).

For free copy circle No. 42 on postcard



fabricated of

Superior

STAINLESS STRIP STEELS

MARK II design
by INTERNATIONAL Silver Company
Meriden, Connecticut

STRATA design
by SHEFFIELD Silver Company
New York, New York

Stainless—without care! Modern hollow ware of Superior Stainless Steel has the sheen of precious metal without penalty of upkeep . . . strength to resist dents and scratches in service . . . and "willingness" in fabrication that permits free range in design and manufacturing methods. For full details on Superior Stainless grades, sizes and tempers fitting your applications, address our Sales Department.

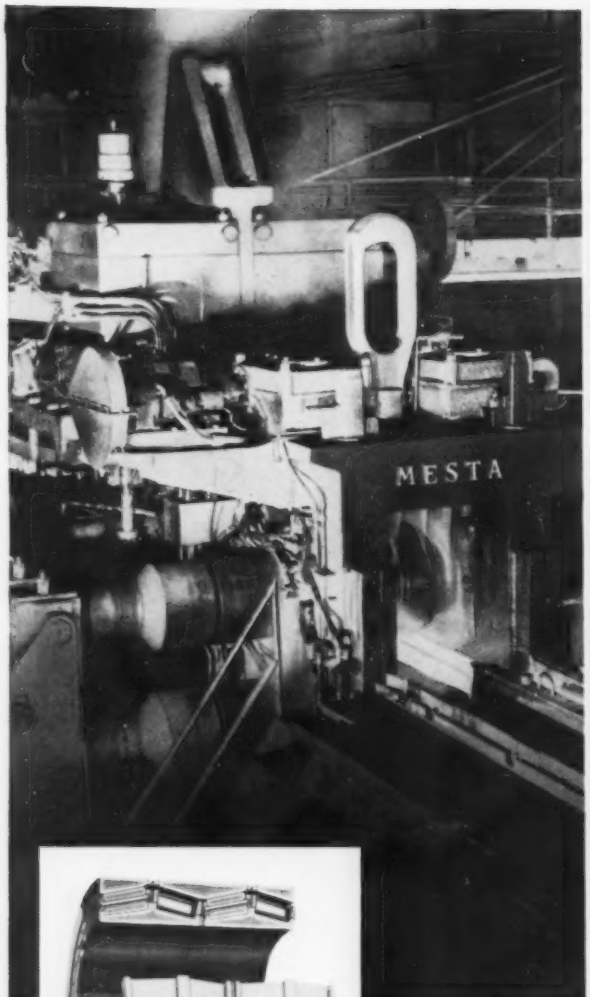
Superior Steel

DIVISION OF

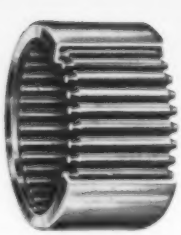
COPPERWELD STEEL COMPANY

CARNEGIE, PENNSYLVANIA

For Export: Copperweld Steel International Company, New York



from
steel mills...



to
farm tractors

Torrington makes the right anti-friction bearing for every basic need!

... Huge Tapered Roller Bearings to handle severe radial and thrust loads in steel rolling mills. Or thin-section Needle Bearings to save space and weight and still provide the highest possible radial capacity.

Between these two examples lie all kinds of requirements. To meet the broad range of needs, Torrington makes every basic type of anti-friction bearings.

The Torrington Company, with this broad experience to draw on, has collaborated with industry in thousands of successful applications. Rely on your Torrington representative for help in developing the *right* anti-friction application for you. **The Torrington Company, Torrington, Conn.—and South Bend 21, Ind.**

design engineering show 1958
International Amphitheatre Chicago April 14-17
VISIT TORRINGTON IN BOOTH 734

TORRINGTON BEARINGS

District Offices and Distributors in Principal Cities of United States and Canada

TAPERED ROLLER • SPHERICAL ROLLER • CYLINDRICAL ROLLER • NEEDLE • BALL • NEEDLE ROLLERS • THRUST

Overrunning Clutch Reduces Mill Stress

Slitting and coiling lines run at 50 fpm one time, 2000 fpm another.

In normal around-the-clock work, speed changes put added stress on workers and machines.

By using overrunning clutches in its equipment one maker reduces wear and tear on both.

▪ In normal operation, metal coil processing lines take a considerable never-ending beating. Though use is often continuous, speeds at which they operate are frequently changed.

Coiled steel may move through a line at 50 fpm when threaded under power through the unit's first stages. But it will run through at up to 2000 fpm when those stages have been de-energized and the takeup reel is supplying the power.

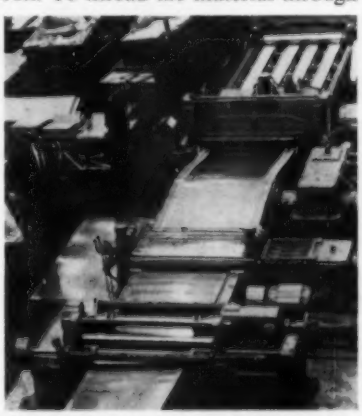
Takes A Toll—In day-in, day-out, night-and-day operation, this can put plenty of stress and strain on machines and workers — especially operating men who may have to shift coil line drives from one speed to another.

With this in mind, Stamco, Inc., New Bremen, Ohio, decided to do something to let operators perform as few operations as possible when using lines it manufactures. But primary consideration must always be given to line efficiency. Lines must stand up under continuing stress.

Clutch Is Answer—The processing-line maker discovered the answer in a clutch produced by Formsprag Co., Warren, Mich. This overrunning clutch eliminates engagement and disengagement steps by the machine operator when moving speed from one range to another.

The clutch's use cuts down wear and tear on employees, speed transmission and equipment. It saves time and reduces possibilities of "human" errors.

How It Works — In a typical slitting line, coiled raw material runs off a payoff reel into a pinch-roll. To thread the material through



Clutches on this slitting line eliminate manual speed shifts.

the machine, the pinch-roll is powered by an electrical motor ranging from 1½ to 5 hp, depending on the line's size.

Want More Data?

You may secure additional information on any item briefed in this section by using the reply card on page 113. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

Is your plant CRITICALLY SHORT of WATER?

You will make major water savings, reduce your costs, solve your problems of water supply or disposal and get HIGH OPERATIONAL EFFICIENCY with Niagara "Aero" Evaporative Heat Exchangers, After Coolers or Condensers for these important plant services or processes:

- AFTER COOLING and air drying for large air and gas compressors and AIR LIQUEFACTION
- COOLING ENGINES, COMPRESSORS, HYDRAULIC PRESSES
- COOLING QUENCH BATHS, FURNACES, INERT ATMOSPHERES
- COOLING ROLLS, WELDERS, DRAWING OR EXTRUSION DIES
- PRODUCT AND PROCESS COOLING CHEMICALS OR INTERMEDIATES
- COOLING LIQUIDS OR GASES IN CLOSED SYSTEMS
- VAPOR CONDENSING UNDER VACUUM
- ELECTRONIC PROCESS COOLING

High operational efficiency means: precise temperature for improved product and process quality control, heat removal at rate of input, simple operating conditions, real economy in upkeep, sustained full capacity.

Also it means cooling in a closed system with your product kept free from contamination or, when condensing, getting a pure condensate holding high quality in your product or material.

Niagara machines do the work of a cooling tower plus shell-and-tube coolers with a single machine that saves piping, water handling disposal and treatment expense and 95% of water consumed by contact cooling methods.

Write for Bulletin 129, 130, 132, 136R.

NIAGARA BLOWER COMPANY

Over 35 years of Service in Industrial Air Engineering

Dept. IA-4, 405 Lexington Avenue
NEW YORK 17, N. Y.

District Engineers
In Principal Cities of U. S. and Canada

Cradle type Logan Down-ender, spring-cushioned chain operated, with electric motor drive. Destined for overseas mill, this unit handles with ease steel coils 60 inch diameter weighing up to 30,000 lbs.
SALES
begin in the
SHOP!

Today, your "man in the field" needs every advantage that you can give him — particularly a favorable price. Cost studies show that the selling edge is often a *price edge* that begins on the production line. That's why management is turning more and more to materials handling in its quest for economy.

Soundly engineered Logan Conveyors have brought savings in time, effort and space to companies large and small for half a century. Perhaps Logan's experienced engineering personnel and time-tested equipment can provide that vital edge in the market place for you, too. Write for literature, or for nearest engineer to call.

LOGAN CO., 545 CABEL ST., LOUISVILLE 6, KY.

Logan Conveyors

TECHNICAL BRIEFS

Metal then threads through the slitter; this cuts it into desired widths or lengths. The slitter also is under power during the threading operation. Motors from 5 to 20-hp operate it.

Works Simply — During threading, the operator energizes these motors by depressing a control-panel button. When the metal threads through the machine, the operator cuts out the threading motors merely by lifting his finger from the button. Ends of the strip are clamped to the rewind mandrel. The rewind reel is powered by a motor which may range up to 200 hp. This is energized by touching another button.

There's no need for disengagement of the pinch-roll or slitter motors; the overrunning clutches immediately go into "free-wheeling" to permit the metal strip to be drawn through these components at high speed.

Automatic disengagement eliminates the human-error element. Otherwise, this could damage personnel, equipment, and material being slit. Time-consuming separate operations might also be necessary.

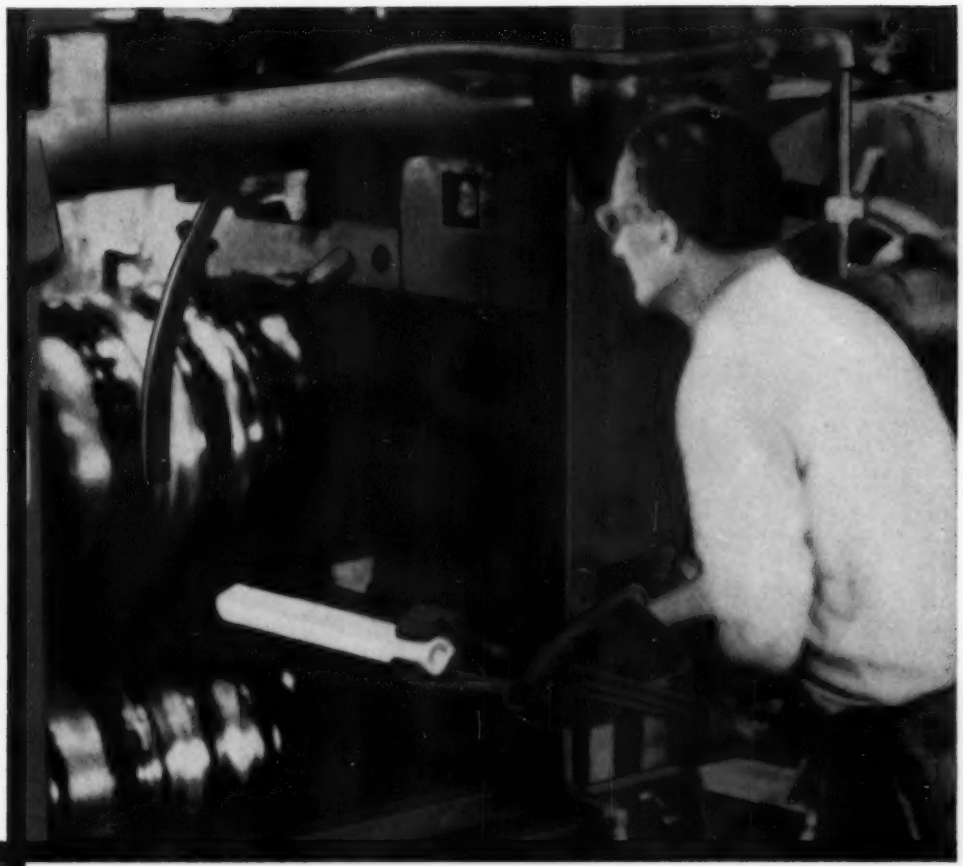
Brazing

Lathe makes handy coiler for brazing rings

A shop lathe and a mandrel can combine to make brazing rings from a spool of silver alloy wire. Large quantities of rings are made in this way by a manufacturer of temperature controls.

The wire, produced by Handy & Harman, New York, is first inserted into a hole in the mandrel. It's bent to hold it in place. The lathe operator rotates the chuck a few turns by hand to get the proper lay of the wire before starting the lathe.

Some Practice Helps — Fenwal, Inc., Ashland, Mass., who uses this idea, says that a little practice will develop the proper balance between



B

where something ***special*** *is required...*

BIRDSBORO *rolls and rolling mill machinery*

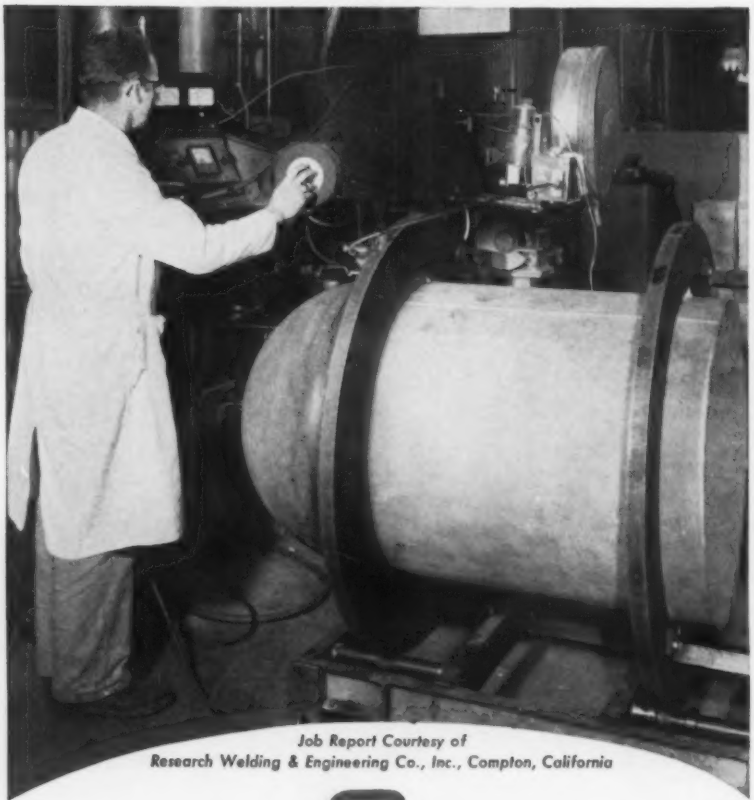
• Whether it's intricate experimental rolling, the taming of hard-to-work steels, or rough, tough, high production duty . . . Birdsboro's specialized mill machinery, or the complete family of rolls, has something specific to offer. You can measure the difference in your own plant: Increased mill production, less metal removal per roll dressing. A talk with your Birdsboro man can fill in other important details. *Main Office, Engineering Department and Plant:* Birdsboro, Pa., *District Office:* Pittsburgh, Pa.

MM 25-58

BIRDSBORO
STEEL FOUNDRY AND MACHINE CO.

STEEL MILL MACHINERY • HYDRAULIC PRESSES • CRUSHING MACHINERY • SPECIAL MACHINERY • STEEL CASTINGS • Weldments "CAST-WELD" Design • ROLLS: Steel, Alloy Iron, Alloy Steel

For flawless high strength weld metal in missile components



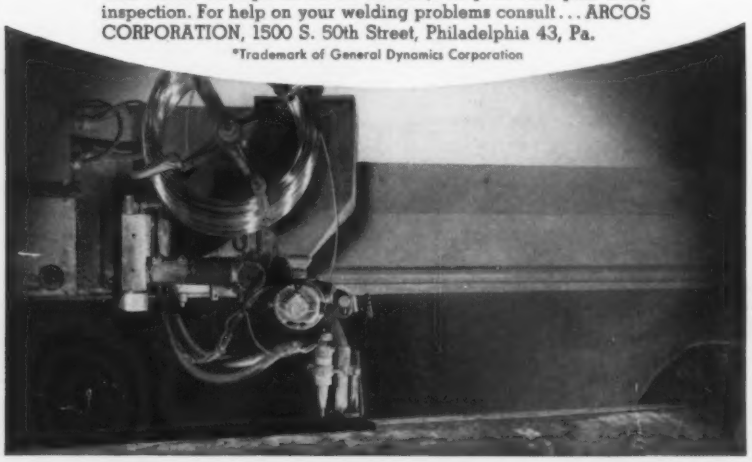
Job Report Courtesy of
Research Welding & Engineering Co., Inc., Compton, California

WELD WITH ARCOS

CHROMENAR Spooled Wire

Light weight was important in this welded missile component that was required to hold air under 3,000 p.s.i. pressure. After making the root pass weld with the Arcos EB* consumable insert, the weld was completed by submerged arc welding with Arcos CHROMENAR CMV welding quality wire. CHROMENAR CMV was selected because its weld metal could be heat treated to match the base metal with tensile strength in excess of 200,000 p.s.i. and pass x-ray inspection. For help on your welding problems consult... ARCOS CORPORATION, 1500 S. 50th Street, Philadelphia 43, Pa.

*Trademark of General Dynamics Corporation



lathe speed and wire feed to give a good coil. Wire should be wound loose enough to slip off the mandrel easily.

The coil is cut into individual rings by clipping it up the side with a pair of wire cutters. This method

Lathe operator coils silver wire onto a rotating mandrel.

gives several hundred brazing rings in a short time.

To prevent contamination of the brazing wire the operator's hands and the mandrel should be clean. The wire should be placed between folds of a clean cloth while the coil is being wound.

Machining

Setup completely machines rail wheels, one every 90 seconds

In the past, machining of railroad car wheels has been done on individual machines. Following one operation, a materials handler would carry them to the next machine.

So it was with Standard Steel Works, Burnham, Pa., a division of Baldwin-Lima-Hamilton Corp. But thanks to Kearney & Trecker Corp., Milwaukee machine tool builder, such operations will merely be colorful reflections of the past. It's building a transfer unit that will completely machine such wheels, turning them out at the rate of one every 90 seconds.

Eliminates Handling — Expected for delivery late in 1958, the transfer unit will handle the wheels in a

vertical position. It will automatically move them from one station to the next, saving time and equipment formerly demanded.

Each station is actually a separate machine tool. But they are smoothly interlocked; they operate as one. Wheels automatically move from the loading position; then tools rough-bore them; two other stations perform facing; two others turn the wheels, followed by automated and accurate inspection. Finally they arrive at the unloading station, completely machined.

Can Work Independently — Design of the machine calls for usual operation as a single unit. However, with no unnecessary effort, each machine and intermediate unit can be operated individually with no effect on the rest of the line.

Weighing about 340,000 lb, the machine will be 118 ft long, 30 ft wide, and 7 ft high.

Finishing

Cleaning before plating reduces pore problem

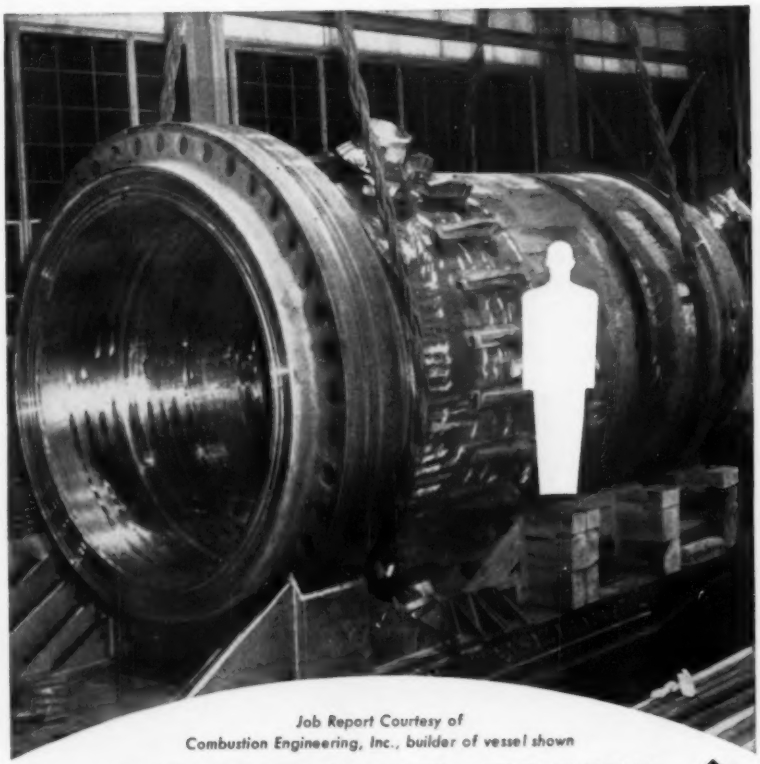
Pore problems bothering many plating men may be solved by following the example of production finishers who use paint. That's the opinion of a large finishing organization.

Research engineers of Wagner Brothers Inc., Detroit, say that continuity of a plated coating on steel parts is more important than its thickness. This can be seen where thin coatings are applied to parts that have been buffed before plating to remove surface blemishes.

Buffing flows the metal along the surface due to wheel pressure and the effect of buffing compound. This closes the existing pores and reduces the chance of oxidation of the base metal.

Good Housekeeping Helps— Continuity of plating may also be disrupted by poor chemical cleaning, dirt in the air, and contamination due to careless maintenance work around the plating tanks.

This WELDED nuclear pressure vessel holds a practical idea for you

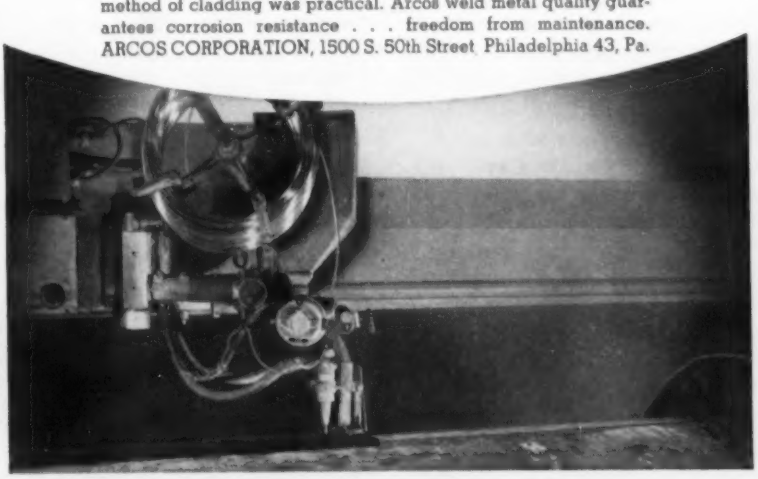


Job Report Courtesy of Combustion Engineering, Inc., builder of vessel shown

USE ARCOSITE FLUX

for submerged arc welding

In nuclear installations where radio activity makes weld failure dangerous to personnel and can cause indefinite shutdown, sound corrosion resistant welds are of utmost importance. To inhibit corrosion, portions of the 9 ft. dia. interior of this 33 ft. reactor were overlaid with ¼ in. of 308L weld metal. Submerged arc welding with ARCOSITE S4 flux was used for the job. The girth and longitudinal joints of the low alloy steel plates were also submerged arc welded using ARCOSITE B5 flux. Cost-wise, no other conventional method of cladding was practical. Arcos weld metal quality guarantees corrosion resistance . . . freedom from maintenance. ARCOS CORPORATION, 1500 S. 50th Street Philadelphia 43, Pa.



Tough Spray Coating Cuts Wear, Abuse

Equipment finishes must be very rugged to stand up under normal shop conditions. But lighter-duty items (like office equipment) need adequate protection against wear, abrasion and corrosion, too.

Appearance is a vital factor. Keeping dents out and color in is important.

▪ Especially for office-type equipment but applicable to other products is a tough new vinyl coating. Based on vinyl resins, the sprayed-on textured material resist a considerable amount of corrosion, staining agents, scratching, abrasion and wear. When minor dents occur, an average maintenance man can hammer them out without need for refinishing the equipment.

Now used on new items being turned out by International Business Machine Corp., the coating possesses good color-retention and oxidation properties. This is one reason for the brilliant colors now identified with new IBM products.

Solves A Problem—Not that IBM didn't want bright hues on its equipment; it's just that the previous finish had a tendency to oxidize and turn dark. It made little sense to sell a customer on the eye-appeal of bright colors when in time they became dark colors.

But the problem was solved by John L. Armitage & Co., Newark, N. J. This firm developed the new finish. Based on vinyl resins supplied by Bakelite Co., a division of Union Carbide Corp., New York, the material has a pebbly, leather-like texture. It's versatility now lets IBM turn out machines in many bright colors (azure, blue, red, yellow, blue gray and charcoal gray).

Water Aids Spraying—To apply vinyl finish, IBM uses an assembly line spray system in front of a curtain of recirculating water. This carries off excess spray. An overhead conveyor moves parts past three workmen. Each sprays on a single coat.

The coating provides a pebbly leather-like texture.

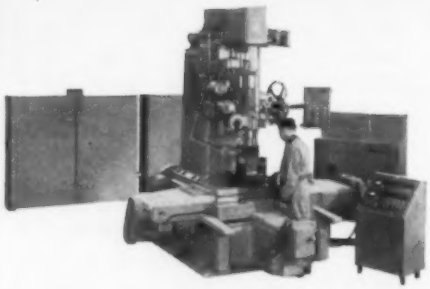
After the third coat, the part moves through a curing oven. Workmen follow-up by spraying on three more coats. Then, there's a final baking. It bakes to a hard finish in 20 minutes.

Foundry

Aluminum casting alloy boasts high strength, light weight

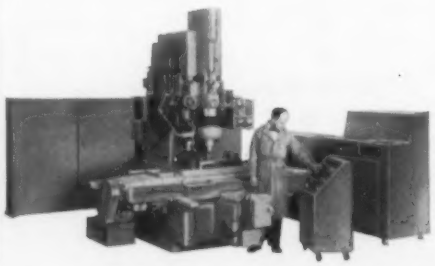
You can reduce product weight 25 to 40 pct and increase strength at the same time by using a new casting material. So find developers of the lightweight aluminum foundry alloy.

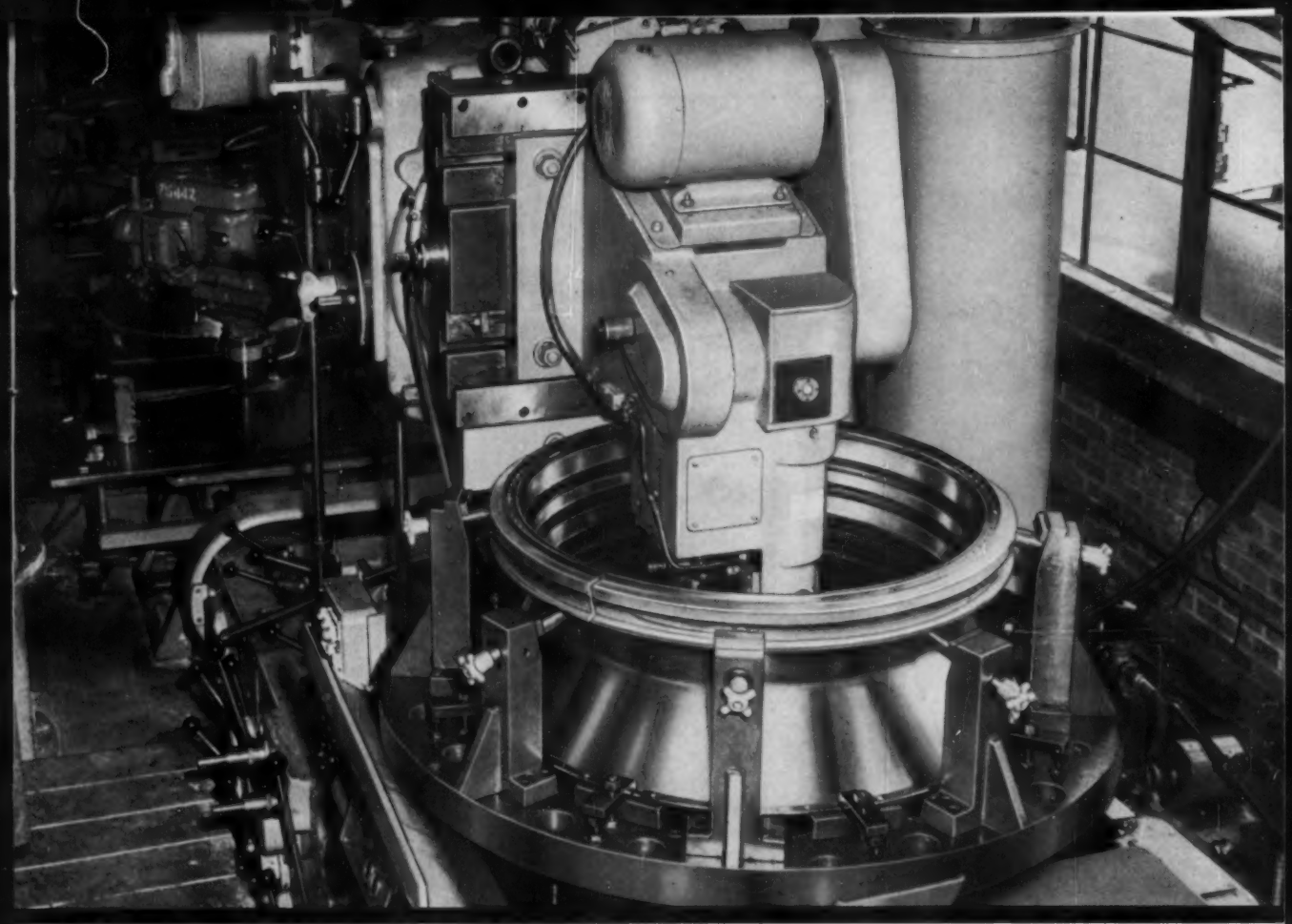
Adding that it possesses exceptional free-flowing characteristics,



OTHER P&W NUMERICALLY CONTROLLED MACHINE TOOLS

. . . include the Electrolimit Jig Borer and the Vertical Precision Hole Grinder.





NO MISTAKES with NUMERICAL CONTROL

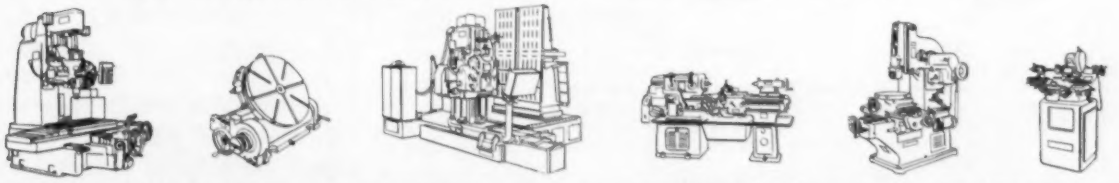
. . . and Machine Time Cut 46%!

These were the results when a Pratt & Whitney Numerically Controlled Rotary Table was put to work by Lycoming Division of AVCO Manufacturing Corporation. This job involves milling 236 slots accurately located on three rings within jet engine cases. Directed by a punched tape, the new table automatically indexes the work for each cut. Indexing is accurate to 5 seconds of arc. In addition, the table's numerical control system governs the milling feed motions . . . putting the entire operation on an automatic cycle.

Replacing a hand-indexing rotary table, the P&W Numerically Controlled Rotary Table has cut machining time 46%! Equally important, P&W Numerical Control eliminates operator error in locating the 236 slots . . . which would turn a nearly completed workpiece into scrap.

Lycoming's experience is no isolated example. Applied to P&W Rotary Tables, Jig Borers and other machines, Pratt & Whitney Numerical Control is producing equally spectacular time-and-money savings in many other plants. It may well offer opportunities for greater profits in *your* plant.

Write now for complete information. Pratt & Whitney Company, Incorporated, 10 Charter Oak Boulevard, West Hartford, Connecticut.



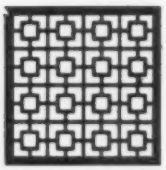
JIG BORERS . . . ROTARY TABLES . . . KELLER MACHINES . . . LATHES . . . VERTICAL SHAPERS . . . CUTTER AND RADIUS GRINDERS

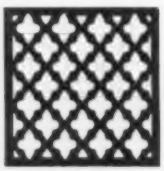
PRATT & WHITNEY

FIRST CHOICE FOR ACCURACY

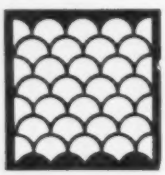
MACHINE TOOLS • GAGES • CUTTING TOOLS

every
HENDRICK
perforated screen is





FUNCTIONAL
DECORATIVE



ECONOMICAL

and you have hundreds of designs to choose from

You can order attractive Hendrick Perforated Screens in many designs, sizes and shapes, with either plain or panel effects. These screens are made in commerically rolled metals and gauges . . . or in masonite, rubber, plastic, or insulated board. They are always made to your specifications . . . by the Pioneer of Perforated Metals, and backed by years of experience and modern manufacturing facilities.

H E N D R I C K
MANUFACTURING COMPANY
37 Dundaff Street • Carbondale, Pa.

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Hendrick Wedge Wire Screens • Architectural Grilles • Mitco Open Steel Flooring • Shur-Site Treads • Armorgrids Hydro Dehazers • Distillation Column Internals

ARMSTRONG
Carbide
TOOL HOLDERS

See us at our BOOTH NO. 308 ASTE SHOW

For Higher Speeds, and Heavier Feeds

ARMSTRONG Carbide Tool Holders and ARMIDE (Carbide Tipped) Cutters come in cased sets for tool rooms and maintenance departments, and individually in all sizes for general machine shop and production turning. They permit not only the ready machining of sand-filled castings, the hardest and toughest steels as well as many heretofore "unmachinable" materials, but also make practical much heavier cuts and cutting speeds up to 600 f.p.m. on ordinary work. They also run from 10 to 100 times as long between regrindings.

Write for Catalog

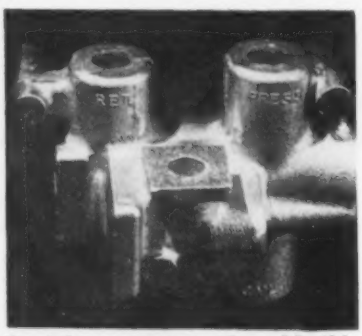
ARMSTRONG BROS. TOOL CO.
"The Tool Holder People"
5209 WEST ARMSTRONG AVE., CHICAGO 46, ILLINOIS
NEW YORK • SAN FRANCISCO

too, Navan Products, Inc., Santa Monica, Calif., points out that the alloy will cast complicated designs by both sand and permanent mold methods with low rejection rates.

A Typical Cast—In a sand casting instance, a valve subject to 1100-psi burst pressure, consisted of a thinwall inner compartment supported by integral studs to an outer shell. It had three corings for drain purposes. Reject rate ran a bare 3 pct when cast with the new alloy.

In a permanent mold instance, a valve subject to 7500-psi burst pressure tested to 10,000 psi with no failure.

Called Tens-50, the alloy represents a new approach to alloying for high strength casting from the conventional "purity" methods. Beryllium and sodium in it neutralize



Cast in a permanent mold, this valve withstood 10,000 psi.

the embrittling effect of iron and silicon. Thus, users find consistent results under average foundry conditions.

Has Hot Strength — While the modifying additives are supposed to enable the average foundry to produce castings of high strength at room temperature, advantages are also observed at elevated temperatures. At 400°F, the ½-hour curve for Tens-50 sand casting-T6 reveals an ultimate tensile strength of 30,000 psi. Yield tensile strengh is 25,000 psi.

The alloy exhibited no corrosion when chromic acid anodized and flash hard anodized specimens in

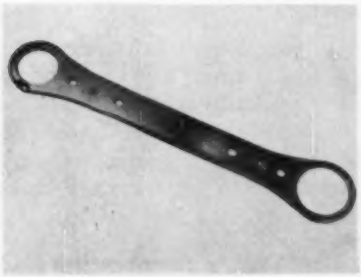
machined and not machined condition were subjected to a standard 90 pc hydrogen peroxide compatibility test.

Materials

Chemically stable solution strips nickel from metals

Chemically stable, a new solution selectively strips nickel plate from any base metal. Handy for reclaiming plating rejects or other applications, it can be kept on a stand-by basis.

Due to its high chemical selectivity, the solution cleans all types of electrolytically deposited nickel



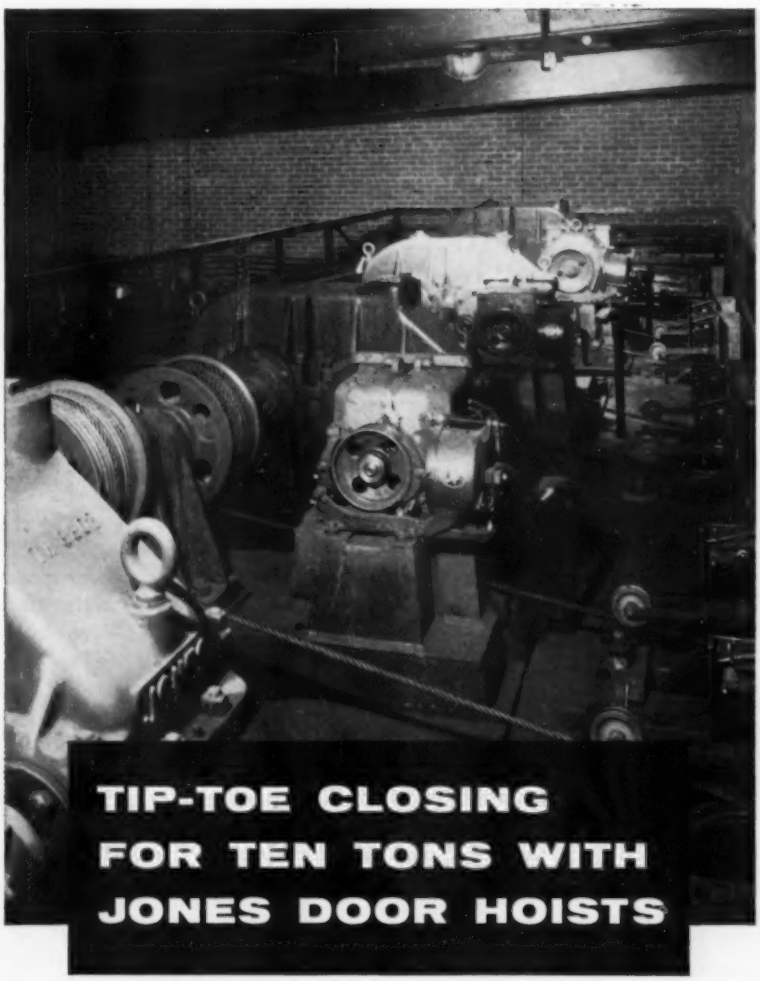
Pitting and etching are absent from this stripped wrench.

and nickel-cobalt plating from any combination of base metals without need for masking. It contains no cyanide or caustic, states its developer, Hanson-Van Winkle-Munning Co., Matawan, N. J. It's nontoxic and reasonably safe to handle.

Cleans Silver — After stripping, copper and brass need only buffing or bright-dipping before replating. The material won't attack silver. It will successfully remove nickel and (because of its porosity) rhodium from silverware and jewelry-like products.

Want More Data?

You may secure additional information on any item briefed in this section by using the reply card on page 113. Just indicate the page on which it appears. Be sure to note exactly the information wanted.



More than five thousand Jones door hoists built in the last twenty-two years have operated doors weighing from a few hundred pounds to more than ten tons. These hoists were engineered for the job to operate from a few inches to many feet, at different time cycles, and with different time travels. Typical reports as a result of this custom engineering: zero impact for ten ton doors; low maintenance cost. The four double-drum hoists pictured here have been in continuous operation for over nineteen years without requiring replacement or repair parts.

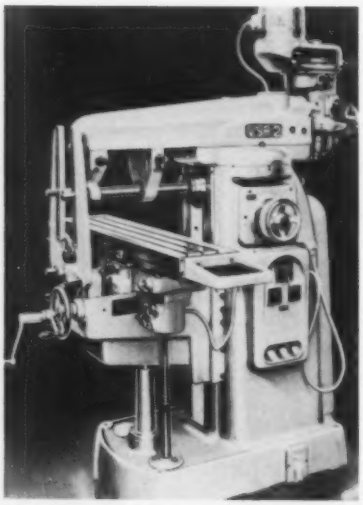
Jones door hoists have been applied not only to operate furnace doors in the steel industry but to operate mill building doors, hinged valves, dampers, splash plates, and other equipment. To find out how H-R products and services can help you, consult your classified telephone directory for the nearest H-R representative, or contact Hewitt-Robins, Stamford, Connecticut.

HR HEWITT-ROBINS

POWER TRANSMISSION DRIVES . . . CONVEYOR BELTING AND IDLERS
INDUSTRIAL HOSE . . . VIBRATING CONVEYORS, SCREENS & SHAKEOUTS

New Production Ideas

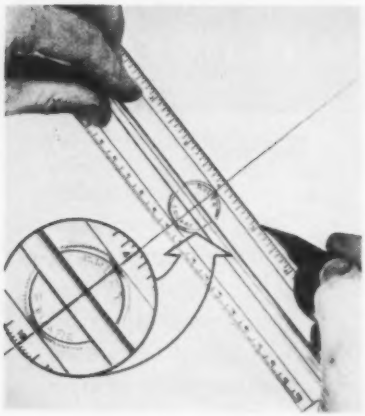
Equipment, Methods and Services



Machine Combines Three Millers Into One

Combining three different millers into one machine tool, both vertical and horizontal spindles of this milling unit can be used simultaneously to mill the same part. The chrome hardened and ground vertical spindle is powered by a 3½-hp 2-speed motor with 16 spindle speeds from 65 to 4750 rpm. It has automatic power feed both up and down (with automatic safety stops) and an R8 Bridgeport or Hardinge taper. The horizontal geared head spindle has an ISA No. 50 taper; this is driven by its own 5-hp 2-speed motor, allowing 12 different spindle speeds from 30 to 1400 rpm. The upper ram arm allows a 360° horizontal swivel; the vertical spindle allows a 180° camlock swivel. Equipped with a 48 x 10 in. worktable, the combination miller provides up to 38 in. automatic longitudinal feed with preselective-type table feeds of ½ to 22 ipm or rapid traverse of 100 ipm. This table will oscillate back and forth and can be used as a surface grinder (with accessory grinding apparatus) when table stops are in place. (Morey Machinery Co. Inc.)

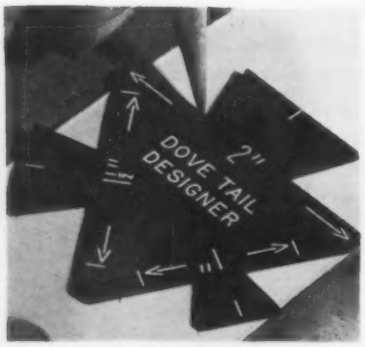
For more data circle No. 43 on postcard, p. 113



Draw Right Angle Lines with Ruler Only

This ruler has a full length prism along its top edge which permits drawing of parallel lines and right angles without the use of a triangle or T-square. To use it, place the ruler across a drawn line or the edge of a piece of paper. This line shows through the transparent ruler. If the line runs through the prism without a jog out of trueness, the ruler is at right angles; it's then ready to draw the line at right angles. If, however, the original line jogs a bit as seen through the prism, or does not form a clean, continuous line, the ruler is not at right angles. A little turn of the ruler straightens the line through the prism to form the right angle desired. The ruler is 8¼ in. long and is light enough to easily be carried in a pocket in its sleeve type package. (Kiva Products, Inc.)

For more data circle No. 44 on postcard, p. 113



Template Allows Accurate Cutting of Gaskets

Accurately designed dovetails can easily be produced by practically anyone using a gasket cutter and a new template. Employed with one manufacturer's extension gasket cutter, the tool simplifies the accurate design of dovetails. The user merely places the dovetail design tool on a gasket flange; employing it as a pattern, he outlines the exact design. Centering lines on the various patterns permit highly accurate application on any width of gasket flanges. This small accessory is made of lightweight phenolic. Gripping points are non-slipping. The dovetail design tool can be employed by anyone using a gasket cutter. (The Zimmerman Packing Co.)

For more data circle No. 45 on postcard, p. 113

Moltrup Steel

COLD DRAWN

... through your *local* Steel Service Center

Warehousing steel via outer space is quite fantastic. But realistic indeed is today's down-to-earth concept of space, time and money you can save through your local steel distributor.

No need to tie up capital and storage space for steel inventories. Reduce handling and processing equipment. Eliminate extra scrap and wastage. Stop paying interest, taxes and insurance on steel stocks that may become obsolete.

AMERICAN STEEL WAREHOUSE ASS'N

Your local phone call in any of the cities listed will bring fast dependable steel warehouse service. Order flats, rounds, squares, hexagons—any or all of the regular shapes in various sizes—also accurate key stocks of MOLTRUP FINE QUALITY COLD DRAWN STEEL.

W2

Consult telephone directory, in cities listed, or ask us for name of distributor nearest you.

Phone: Beaver Falls—730.

Moltrup *Steel Products Co.*

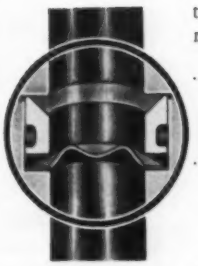
BEAVER FALLS, PA.

NEW VALVE FOR THE ORIGINAL EQUIPMENT MARKET

250 P. S. I. four-way air valves in ¼, ⅜ and ½ inch pipe sizes.

This is a re-design of our proven 250 P. S. I. air valve.

NEW LOW PRICE (*the result*) FACE LIFT (*the reason*)



None of the operating advantages of this rugged *'Shear-Seal'* valve has been reduced one iota!

. . . same non-corrosive construction throughout — eliminates failures due to rust.

. . . same long wearing leak-proof qualities — metal to metal *'Shear-Seal'* design is not sensitive to dirt, compensates for wear.

. . . same installation savings — because no oilers or filters are needed.

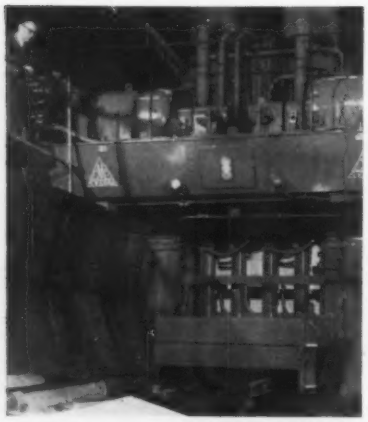
Only the exterior has been modified — tailored to the special preference of the Original Equipment Manufacturers — and, as a result, costs and prices have been substantially reduced.

Write for bulletin 5000 which includes design specs.

CONTROL VALVE DIVISION

Barksdale valves

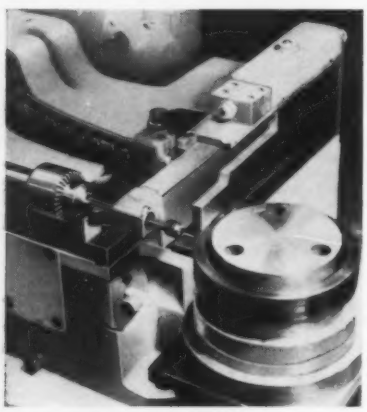
5125 ALCOA AVENUE • LOS ANGELES 58 • CALIFORNIA



Rugged Shear Cuts 30-tons of Scrap An Hour

Weighing 1275 tons, this big scrap shear has a 600-ton capacity. Looking much like a heavy-duty industrial press, it's actually designed as a rugged, all-weather, outdoor shear. It takes 5⅜-in. diam steel rounds or stacks of 1¼-in. thick plate with ease. Cutting at a 30-ton per hour clip, it'll deliver 6-in. lengths of material on order. Not only does it look like a press, it features very accurate adjustment. Scrap can be cut from 6- to 48-in. lengths in 6-in. increments. Scrap loads into its hopper via magnetic crane. The hopper batch-dumps the scrap load into a feed box. A lid closes down at 95-ton pressure; 100-ton hold-down pins the scrap during cutting. A hydraulic ram pushes scrap into the shear with a 50-ton pressure. With scrap requiring full shear pressure, it will cut at a 5-cycle per minute rate. (Clearing Machine Corp.)

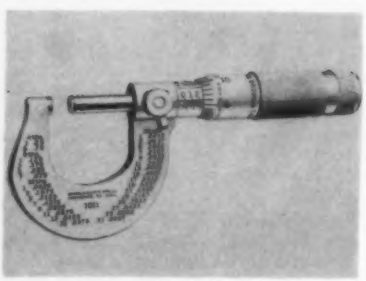
For more data circle No. 46 on postcard, p. 113



Machine Drives Set-screws At High Speeds

Designed for "building block" use, a new set-screw driver fits into high-speed, automated production lines. It automatically feeds, inserts and tightens socket set-screws ranging in diameter from No. 6 (approximately 0.138 in.) up to ⅜ in., in lengths up to ¾ in. The rapid unit can make up to 2500 complete installations an hour in as many different product assemblies. Field tests indicate that installation costs —normally a major expense in a fastener connection—can be cut to as low as ½¢ per screw. The machine is suited, by its mechanical design and electronic control system, for use either as an attachment to a single machine or as an integral part in a continuous, even completely automated production line. (Standard Pressed Steel Co.)

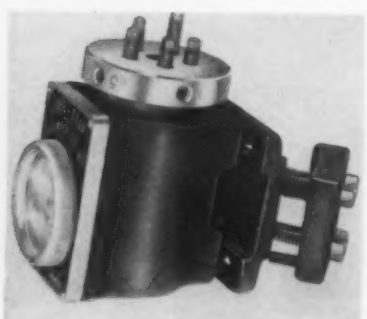
For more data circle No. 47 on postcard, p. 113



Micrometer Doubles As Fixed, Friction Type

This finger-tip control micrometer employs a convertible thimble. This permits the micrometer to be used, at will, either as a "friction" or "fixed" type. Used conventionally, the operator depends on sense of feel for measurements. If he prefers the slip or friction type, a slight rotation of the nut friction control provides a uniform measuring pressure. A lever-type floating lock allows "miking" and locking with one hand; a flick of the lever is all that is required. (Brown & Sharpe Mfg. Co.)

For more data circle No. 48 on postcard, p. 113



Lets Semi-skilled User Hold Close Tolerances

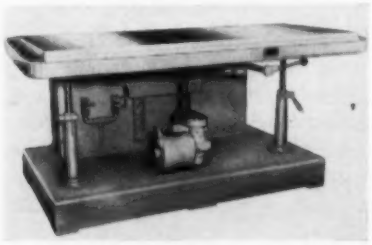
Your semi-skilled lathe operators can now be as intolerant about tolerances as your best shopmen. All they need is a lathe equipped with a new device which lets semi-experienced men hold tolerances of ±0.001-in. or closer. And it's done on ordinary engine lathes. What the device does is this: It eliminates the "sense of feel" control that so often gives a highly skilled man good results every time. This "sense of feel" is used with a series of mechanical stops usually. Normally, the operator stops the travel of his cutting tool when the carriage touches a mechanical stop. When it touches the stop, an inexperienced man may exert 1-lb pressure at one time, 1½ lb at another, maybe ¾ lb a third

time. Thus, the cutter takes a corresponding slight amount off the workpiece. Of course, if you exert the same pressure every time, you get the same accurate dimensions every time. The new stopping control uses five adjustable stop rods. These tell the operator precisely where to stop; they let him quickly find and duplicate his previous setting. (D-S-C Machine Co., Inc.)

For more data circle No. 49 on postcard, p. 113

Drilling Table

Power actuated, a new table for drilling machines provides easy-up-and-down table movement. Its maker especially recommends it as a time-saver and operator-fatigue reducer where frequent table changes are necessary. To accommodate



heavy parts loading, the table quickly lowers to its lowest level. Here, the big part can be easily lifted into position. Then, in seconds, the table can be returned to working position. One simple lever controls all movements. (Edlund Machinery Co.)

For more data circle No. 50 on postcard, p. 113

Ceramic Magnets

Highly oriented ceramic permanent magnets now available conserve space and critical materials. Using barium-oxide oriented in the direction of pressing, the magnets serve uses in medium size dc motors, separators and magnetic chucks. (Indiana Steel Products Co.)

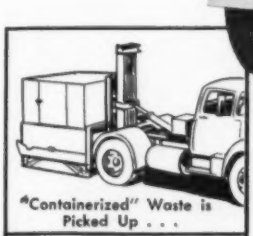
For more data circle No. 51 on postcard, p. 113

Scrap Baler

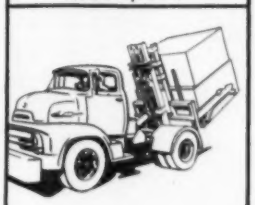
For baling scrap metal, a new hydraulic press can compress an entire passenger automobile (less

Driver's Mighty Robot Arms Hoist Giant Pay-Loads of Plant Refuse

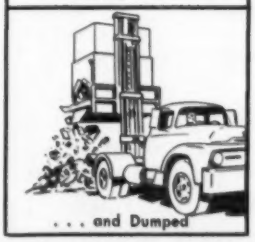
THE GRD 304 F-2



"Containerized" Waste is Picked Up . . .



Hauled . . .



. . . and Dumped

Dempster-Dumpster GRD Hauls and Dumps "Containerized" Waste

Industrial leaders, municipalities and contract haulers cut costs by "Containerizing" refuse or waste in clean, enclosed steel containers ranging up to 15 cu. yd. capacity. Handling these big containers is "duck soup" for the GRD, which backs up, engages two lifting pins, hoists the container into carrying position and moves out. Destination for the high-dumping GRD can be a disposal area, railroad gondola car, high-side open trailer or one of the new Dempster-Dumpster Packer Trailers. This 45-yard packer trailer beats the "long-haul" problem by hydraulically compressing 130 to 140 cubic yards of rubbish into its body before being towed to the disposal area. Write today for free bulletin on the GRD.

Mfd. by Dempster Brothers, Inc.

PARTIAL LIST OF USERS

Armco Steel Co.
E. I. du Pont
Ethyl Corp.
WESTVACO
Chas. Pfizer & Co.
McWhirter, Inc.
Army & Navy Bases

DEMPSTER DUMPSTER®

GRD prepares to dump into new 45-yard Dempster-Dumpster Packer Trailer

DEMPSTER BROTHERS, Knoxville 17, Tenn., Dept. IA-4

engine and axles) into a 16 x 24 x 60 in. bale. Tests made on this press produced a bale of less than 15 cu ft volume, weighing 2100 lb, an average density of 140 lb per cu ft. The press is designed for sturdy construction and fast, quiet operation. It employs a new, simple, full flow, fully cushioned hydraulic circuit; this reduces line shock and line hammer. Excluding charging time, a skilled operator requires about 1½ minutes for the complete operation. The machine is entirely self-contained. It mounts on the simplest type foundation. (The Wheland Co.)

For more data circle No. 52 on postcard, p. 113

Valves

A new series of 0- to 250-psi manual four-way air and oil valves is priced to be of specific interest to original equipment manufacturers. The valves feature a leak-proof construction which prevents both internal and external leakage. Valves are identically the same in mechanical design as the maker's more expensive high pressure models. Since many original equipment manufacturers do not normally require a

mounting bracket and prefer to paint the complete power unit after assembly, the mounting bracket and baked enamel finish have been eliminated. In answer to requests, a ball type handle replaces the previous lever type handle. (Barksdale Valves)

For more data circle No. 53 on postcard, p. 113

Electro-erosion Unit

A new electro-erosion machine features low electrode consumption when eroding hardened tool steel or stainless steel with a copper elec-

trode. Normal working accuracy on the unit is ±0.0004 in. Boring capacity is from 0.002 to 1½ in. diameter. The unit is composed of

...reliable SPENCER blowers

Time after time, men who know specify SPENCER
—for original equipment or replacement.

Proven dependability is the reason. Simple construction, constant pressure at varying volumes, mounting that requires no special foundations—these are some of the reasons why SPENCER IS PREFERRED.

Whatever your requirement in blowers—from ⅓ to 1,000 H.P., volumes up to 20,000 CFM, pressures from 4 oz. to 10 lbs., it will pay to check with SPENCER.

Photo shows 60 Ton Billet Heating Furnace installed at the Colorado Fuel & Iron Corp., Wickwire Spencer Steel Div., Buffalo, N.Y. A SPENCER 100 H.P., 1750 RPM Turbo Compressor rated 18,000 CFM at 12 oz. pressure furnishes combustion air.

Request Catalog 126-A containing complete specifications.

The SPENCER TURBINE COMPANY
HARTFORD 6, CONNECTICUT

OTHER QUALITY SPENCER PRODUCTS

STATIONARY VACUUM SYSTEMS

PORTABLE VACUUM CLEANERS

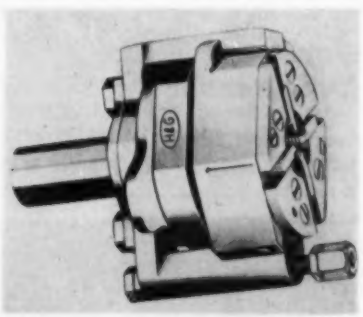
PNEUMATIC CONVEYING SYSTEMS

three individual units: (1) the machine tool proper, (2) the generator and (3) the pump assembly. It's designed on the "building block" principle. Feed and operation are regulated by an electromechanical servo system with no electronic tubes. This provides a virtually foolproof method of operation. Adjustment of voltage, current and capacity by electric switches provides the spark density needed for desired surface finish and rate of stock removal. Possible surface finish: 10 to 12 microinches rms with hardened steel; 5 to 6 microinches rms with carbide. (Cosa Corp.)

For more data circle No. 54 on postcard, p. 113

Die Heads

Aluminum die heads now available are made from a special alloy of aluminum and given a special surface treatment. These die heads are light in weight for a given capacity. This is an important factor on new high speed, fast indexing machines. These lightweight die heads reduce vibration on turret indexing mechanisms. Another advantage is that chaser life and thread quality are improved, according to the manufacturer. (The Eastern Machine Screw Corp.)



For more data circle No. 55 on postcard, p. 113

Welding System

Using automatic welding-wire feed, an inert gas shielded arc welding system now available is highly flexible. The feeder pushes or pulls the wire from spools or coils to the weld pool. A trigger switch actuates the pistol grip hand gun. Containing the wire feed speed selector and welding wire supply, the wire feeder connects to the control cabinet via a flexible cable assembly. This permits it to be near the job. The control cabinet contains equipment which coordinates the wire feed with the flow of shielding gas, water and welding current. Inert gas flows from the gun during welding. Thus, it excludes air and eliminates need for flux for atmospheric protection. This system can be used also with an automatic head for mechanized welding. (Air Reduction Sales Co.)

For more data circle No. 56 on postcard, p. 113

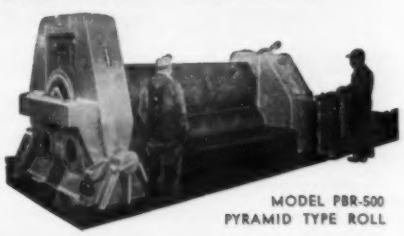
Turret Lathe

This high-speed turret lathe handles both secondary operations and production work. It combines power and capacity with modern styling and controls. Versatility of its 13-in. swing over the bedways and large

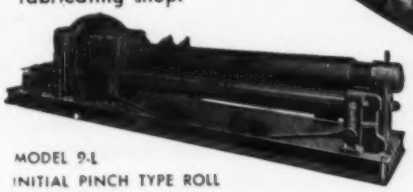
WEBB PLATE FABRICATING MACHINERY

PLATE BENDING ROLLS

The Webb Corporation offers a complete line of Plate Bending Rolls for the rolling of the thinnest plate up to plate 2½" thick. Offered in a variety of lengths and thicknesses. Constructed for the modern fabricating shop.



MODEL PBR-500
PYRAMID TYPE ROLL



MODEL 9-L
INITIAL PINCH TYPE ROLL

Two types available: the Initial Pinch Type and Pyramid Type machines. All latest advantages of today's modern machine tools are incorporated, utilizing anti-friction bearings, totally enclosed gear drives. Special forming rolls for culvert pipe, stock tanks and other special shapes available.

SLIP ROLLS

A complete line of small Sheet Metal Forming Rolls are also available. All power-driven with shaft sizes 3" to 5" for the handling of the thinnest gauge material, up to 8 gauge material. Special rolls for the forming of polished sheets, aluminum and stainless steels can be furnished. Complete catalogues on any size machine furnished upon request; write Dept. E.

SLIP ROLLS
UP TO 8 GAUGE PLATE

Let Speed PAY–The WEBB Way!

SLIP ROLLS

PYRAMID TYPE ROLL

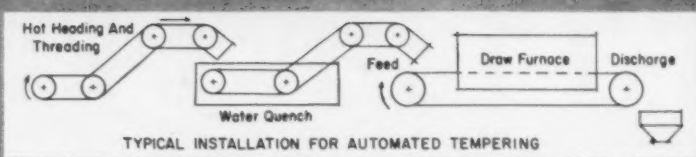
INITIAL TYPE ROLL

STEELWORKERS

See Our Booth #809—AWS Welding Show—St. Louis, Mo.

Since 1881 THE WEBB CORP.
WEBB CITY, MO., U. S. A.

Cambridge WOVEN WIRE BELTS



TYPICAL INSTALLATION FOR AUTOMATED TEMPERING

METAL-MESH BELTS RESIST WARPING OR BUCKLING—CUT COSTS IN CONTINUOUS HEAT TREATING

Moving thousands of pounds of bolts per hour through 1150° F. temperatures is a cinch for rugged Cambridge Woven Wire Belts because they're designed to take high temperatures with a minimum of operating trouble and maintenance. And, open mesh construction assures high product uniformity. Furnace heat flows through the belt and around product for fast, thorough processing.

In cleaning, brazing, oiling and quenching operations, too, Cambridge Belts help increase production and maintain high product uniformity. Here's how:

CONTINUOUSLY MOVING BELTS ELIMINATE BATCH PROCESSING—give faster, less costly production; reduce slow, costly manual handling.

ALL-METAL CONSTRUCTION IS HEATPROOF, COLDPROOF, ACIDPROOF—Cambridge Belts can be woven from any metal or alloy to take sub-zero or up to 2100° F. temperatures, yet remain impervious to attack from water, acids or caustic solutions.

OPEN MESH PROVIDES FREE AIR, LIQUID CIRCULATION—gives more uniform heating, cooling, drying; permits flash drainage of solutions, rapid washing, quenching and cleaning.

SPECIAL SURFACE ATTACHMENTS AVAILABLE—raised edges or cross flights to hold product on belt during movement.

Talk to your Cambridge Field Engineer soon—he'll explain the many advantages of continuous heat treating on Cambridge Woven Wire Belts. He'll recommend the belt size, mesh or weave—in the metal or alloy—best suited to your operations. You'll find his name in the classified phone book under "BELTING, MECHANICAL". Or write for FREE 130-PAGE REFERENCE MANUAL giving mesh specifications, design information and metallurgical data.

The Cambridge Wire Cloth Co.

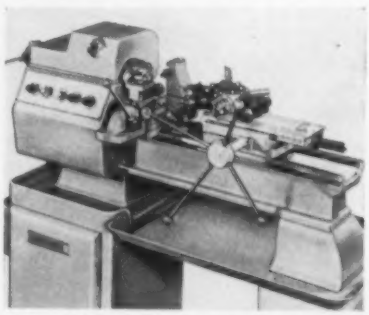
WIRE CLOTH | METAL-MESH CONVEYOR BELTS | WIRE CLOTH FABRICATIONS

Department A, Cambridge 4, Maryland

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

NEW EQUIPMENT

1 1/16-in. collet capacity equips the lathe for both chucking and precision collet work. Variable spindle speeds from 40 to 2000 rpm are selected automatically by "fast-slow" pushbutton controls. Actual spindle speeds are read from a built-in tachometer in the headstock. The

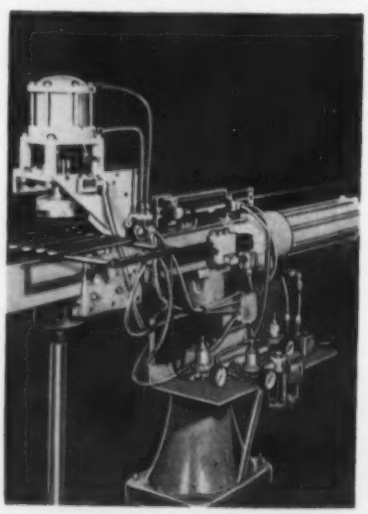


lathe has a production type hand-lever collet attachment with 1 1/16-in. collet capacity. A six-station ram turret accommodates up to 1-in. shank turret tools. (Sheldon Machine Co., Inc.)

For more data circle No. 57 on postcard, p. 113

Tube Bender

Thin-wall copper and aluminum tubing can be bent up to 180° with a new bending machine. It operates



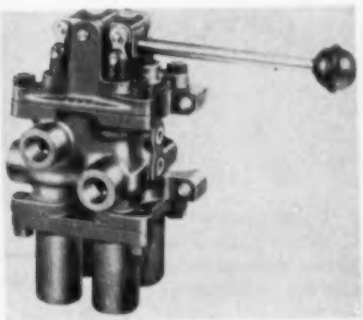
at speeds reaching 900 bends an hour. Boasting simplicity of set-up and operation, the unit makes serpentine bends with ease. It employs an automatic head, feed and

table return. Completely air-operated, it makes wrinkle-free bends on 0.017-in. wall tubing; it'll easily handle tubing up to 40-ft long, ¼ to ⅝-in. diam. (Paul Machine Tool & Die Works).

For more data circle No. 58 on postcard, p. 113

Valve

Especially designed for use with raw cold water, oil or glycol-base fluids, a new ½-in. NPT, lever operated valve handles 1000 psi. The 4-way neutral valve is widely used for controlling press loading lift



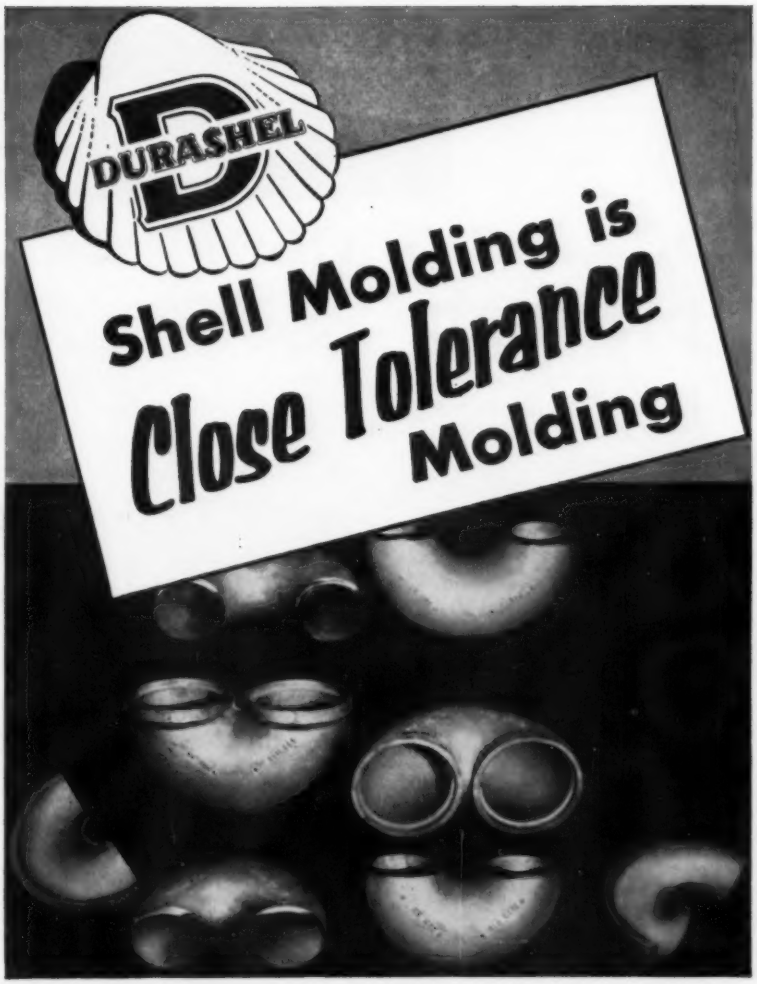
tables. It'll handle applications where tight sealing and leak-free operations are required. Valves are available both in 3- and 4-way types. All ports are closed in the neutral position. (Sinclair - Collins Valve Co.)

For more data circle No. 59 on postcard, p. 113

Grinder, Lapper

In a new unit's operations, low cost, high production grinding combines with quality lapping. Considered practical for flat or surface-ground parts, it provides degrees of finish from 32 to 1 microinches and flatness from 0.010 to 0.000002 in. By lap-grinding, which uses loose grit, intermediate jobs of rough grinding or even milling operations can be eliminated. Parts are ready for the 32-in. unit as cast, sintered, stamped or turned. It handles either rough or finish work in a full range from tough carbides and steels through ceramics and plastics. The unit's ability to do both grinding and lapping assures fast stock removal. (The Abrading Systems Co.)

For more data circle No. 60 on postcard, p. 113



These are Duraloy Shell Molded 180° Bends. And incidentally, several different alloying combinations of chrome iron and nickel are represented in these bends.

One of the outstanding values in shell molded castings is the higher precision or close tolerance casting . . . also usually less machining and finishing . . . than when pieces are cast statically. For quantity production it is usually more economical.

We suggest that you investigate shell molding for your high alloy casting requirements. It has much to offer and we have complete facilities for taking care of your requirements. Should other casting methods—static or centrifugal be better, we have these facilities, too.

The DURALOY Company
OFFICE AND PLANT: Scottdale, Pa.
EASTERN OFFICE: 12 East 41st Street, New York 17, N. Y.
ATLANTA OFFICE: 76—4th Street, N.W.
CHICAGO OFFICE: 332 South Michigan Avenue
DETROIT OFFICE: 23906 Woodward Avenue, Pleasant Ridge, Mich.

Inland "job-tailored"
Cold Rolled Sheets work better

product: Television Cabinets

problem:

For Cabinet:
A smooth, flat steel sheet was required that would provide the right surface for finishing, time after time.

For Picture Tube Frame:
A steel that would take a difficult draw in stride, and also possess necessary surface characteristics for finishing.

solution:

Inland Cold Rolled commercial quality sheets provided all the properties needed to meet the requirements for cabinet application.

An Inland drawing quality Cold Rolled Sheet produced with the desired ductility and surface filled the bill for the picture tube frame.

Both sheets were "job-tailored" for this customer by Inland Steel Cold Rolled Sheet specialists.

INLAND STEEL

Cold Rolled Sheets

At your service in 1958...Inland's new Cold Mill and a 50% increase in capacity for cold rolled sheet products.

Sales offices: Chicago • Milwaukee • St. Paul • Davenport • St. Louis Kansas City • Indianapolis • Detroit • New York

The Iron Age Summary

Is Steel Slump Nearing an End?

Two prominent market analysts look for reversal of the downturn this month or next.

Detroit earns dubious honor as hardest hit of the nation's steelmaking centers.

▪ Has the slump in steel about run its course? The current rash of plant shutdowns and worker layoffs is anything but encouraging. But some levelheaded market analysts think an upturn is in the cards for the next two months.

"I'll admit the order books don't show it, but I have good reason to believe that April will reverse the downtrend," a market research director for a major steel company said.

Pickup Forecast—Another market analyst who correctly forecast the slump in steel demand puts it this way: "There will be a definite upturn in May and June. I look for steel output to hit 70 pct of capacity in May, compared with the current level of about 50 pct." He predicts that output for the year will run about 95 million tons, or less than 70 pct of industry capacity.

Meanwhile, the bad news continues to mount. Some Monday morning quarterbacks are even beginning to wonder whether steel expansion in recent years was overdone. At any rate, the current slump indicates that present capacity is enough to meet foreseeable demand for the next several years.

Detroit Hit Hard—Detroit is the hardest hit of the steel producing centers. There, ingot production dropped to less than 30 pct of capacity this week. It could fall to as low as 10 pct of capacity next week. This would probably be the lowest non-strike production level in Detroit's history.

Ford Motor Co. shut down its steelmaking operations for a minimum of three weeks, and also halted steel rolling units. McLouth Steel Corp. idled the last of its six electric furnaces, leaving only its blast furnace and oxygen converter unit in operation. Great Lakes Steel Corp. is closing its steelmaking operations at the end of this week for a period of two to three weeks.

Construction Revival — Seasonal factors are likely to keep the steel market from falling apart completely. Products that go into construction are showing signs of reviving. Wire products are picking up seasonally. The advent of good weather will spur the start of construction projects that have been held in abeyance.

Overseas mills also are feeling the pinch. British steel buyers are holding up placements of new business; and order backlogs are thinning out. Capital investment in Britain has been falling for some time. British mills have cut their finished steel prices in a range of one to three per cent to reflect savings due to lower freight rates on imported iron ore, and decreasing dependence on other imported materials.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week 1,298	Last Week 1,366	Month Ago 1,425	Year Ago 2,368
Ingot Index (1947-1949=100)	80.8	85.0	88.7	147.4
Operating Rates				
Chicago	54.0	56.5*	58.0	86.0
Pittsburgh	53.5	56.5	55.5	95.0
Philadelphia	53.0	57.0	57.0	105.0
Valley	38.0	40.0*	44.5	82.0
West	61.0	65.0*	74.0	100.0
Buffalo	39.0	37.0	37.0	93.0
Cleveland	48.0	47.0*	34.0	92.0
Detroit	21.0	28.0	44.0	99.0
S. Ohio River	44.0	55.0*	28.0	66.0
South	47.5	47.5	51.5	97.0
Upper Ohio R.	69.0	76.0*	67.5	89.0
St. Louis	70.0	70.0	79.0	101.0
Northeast	31.0	31.0	31.0	66.0
Aggregate		50.6	52.8	92.5

*Revised

Prices At a Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.967	5.967	5.967	5.670
Pig Iron (Gross ton)	$66.49	$66.49	$66.49	$64.56
Scrap, No. 1 hvy (Gross Ton)	$34.00	$35.00	$37.67	$44.17
No. 2 bundles	$25.17	$26.17	$28.50	$35.83
Nonferrous				
Aluminum ingot	28.10	28.10	28.10	27.10
Copper, electrolytic	25.00	25.00	25.00	32.00
Lead, St. Louis	12.80	12.80	12.80	15.80
Magnesium ingot	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	93.25	93.625*	95.50	98.875
Zinc, E. St. Louis	10.00	10.00	10.00	13.50

Mill Equipment Benefits Pushed

Sellers are out to convince steel mills this is the time to modernize or expand.

They are stressing cost savings and quality advantages of new equipment.

▪ How do you sell a man new equipment when his sales have just dropped 50 pct?

Suppliers of steel mill equipment have about 12 months to find an answer to this one. The momentum of three good years in steel will carry them through most of 1958 at a high level. After that, new orders must pick up the load and right now new business is developing slowly.

"Buy Now" Approach—Builders offer strong arguments for continued expansion and modernization:

Bidding on new jobs is highly competitive now; the longer a mill delays, the more it will have to spend for new equipment.

Jobs started now should be ready for the next big market surge. Delivery times are down by 6 to 12 months for openhearths, electric furnaces, and other major equipment items.

Modern equipment can offer critical cost savings and quality advantages.

In the past, none of the arguments has been enough. When steel sales dropped, the mills stopped spending. This time, suppliers are hoping they can avoid the traditional famine.

They are encouraged by a growing trend in steel toward long range planning. The mills went into 1958 with commitments to spend $1 billion for replacement and expansion. This is down from the record $1.75 billion spent in 1957 but is still a respectable total for an off year.

Cost Concern—Another special consideration today is the growing concern of steelmakers for cost inflation. U. S. Steel reports the price of a coil annealing furnace jumped 170.9 pct between 1951 and 1957. From 1930 to 1957 the cost of building a blast furnace climbed 525 pct.

Finally, technical improvements are coming at a rapid rate. One four-stand cold mill recently installed has five times the capacity of the unit it replaced. This kind of production puts heavy pressure on mills for the replacement of high cost equipment.

Competitive Pressures—Improvement can force mills into action. In the aluminum industry, Alcoa recently installed a 160 in. breakdown mill to meet aircraft needs for wider sheet and plate. Kaiser quickly followed with a 168 in. mill. Reynolds is now putting in a 170 in. mill. United Engineering built all three.

The steel industry is being asked for sheets up to 150 in., rolled to aircraft tolerances. At least one builder is now experimenting on new ways of meeting aircraft and missile needs. If a steel plant puts in a mill that does the job, others may be forced to go along.

Deliveries Shorten—Typical delivery schedules have fallen from year-ago levels. Major rolling mills are down from 24 months to 12-18 months. Electric drives and controls telescoped from 18 to 12 months. Openhearths have declined from 16 - 20 months to 10 - 12 months. And electric furnaces, then 12 months, are now 6-8 months.

STILL HEALTHY: Backlogs for steel mill rolling equipment have declined from 1957 levels, but they are still robust enough to assure manufacturers of good business this year. (National Steel Corp. photograph.)

"they build the biggest variety of exchangers and condensers in the business"

Companies large and small throw a volley of heat transfer curves at Ross and get time-saving, cost-cutting answers. Operating on a "you name it, we'll do it" basis, Ross has designed and built practically every type and size of heat exchange equipment in use today.

By putting top engineering brains to work on routine as well as highly specialized assignments, Ross has racked up a string of "firsts" that date back to 1917.

Today, with a large new plant in operation, this team of specialists is ready to custom build or mass produce *on a greater scale than ever before.* A division of American-Standard*, Ross Heat Exchanger is geared to deliver the goods, from miniature oil coolers to mammoth field-erected surface condensers.

The next time you've got a heat transfer problem, put it up to Ross early in the game. Meanwhile, get a closer look at Ross men, facilities and products. Write for new illustrated booklet "THIS IS ROSS — READY FOR YOU."

American-Standard, Ross Heat Exchanger Division, Buffalo 5, N. Y. In Canada: American-Standard Products (Canada) Ltd., Station D, Toronto, Ont.

*American-Standard, and Standard ® are trademarks of American Radiator & Standard Sanitary Corporation.

American-Standard Products

AMERICAN-Standard

ROSS HEAT EXCHANGER DIVISION

Building Aids Sales But Gains Are Small

Seasonal upturn in construction helps sales for a variety of products.

However, orders are the "rush-rush" variety, requiring nimble footwork by the mills.

■ Construction activity is aiding a wide variety of steel products, but so far the gains are nothing to cheer about.

Among items sharing in the seasonal upturn are fabricated plate and structurals, standard pipe, reinforcing bar, rod, welded wire fabric, and merchant wire.

Amid all the excitement the mills are still working hard to make sales. Because fabricators are working on reduced inventories most of their orders are of the "rush-rush" variety and for small tonnages. Producers must move fast to fill them, often relying on semi-finished stocks to speed processing time.

Overseas Competition — In one market area the construction boost has only improved the steel order pace by 5 pct over month ago levels. In another, mills expecting a flood of orders for reinforcing bar are still waiting. They believe contractors are holding back on orders hoping for a better break on prices from fabricators.

One other factor makes selling difficult for U. S. mills: Foreign steel. Users in the Midwest, for example, are inquiring about imported structurals. They are not troubled, apparently, about waiting for delivery. Recent price cuts by overseas producers are more of a lure, especially if the buyers can place advance orders.

Sheet and Strip—Market remains in the doldrums. Some mills indicate April tonnages may be below those of March. Automotive ordering continues weak. Other buyers are only filling holes in stocks.

Producers in the **Midwest** still have stocks of semi-finished product on hand. This would hold down production of raw steel even if the rolling mills got busier.

High carbon strip in the spring steel grades is the single exception to the depressed state of the market. It is moving better than the general run of sheet and strip items.

Plate—Seasonal pickup is helping mills to a degree, but not enough to boost mill rolling rates or cut down semi-finished inventories of slab. Shipbuilding and construction buying continues buoying up the **Eastern** market.

United States Steel Corp. is planning major improvements in its present wide plate manufacturing facilities in the **Chicago** district. Engineering work is underway looking toward the installation of facilities permitting expansion of production.

Pipe and Tubing—Standard and buttweld pipe used for home and commercial construction have improved seasonally. Production in the **Cleveland** area is about 70 pct of capacity, making it one of the stronger steel products. Oil country goods are slow. One **Eastern** mill sales office doesn't expect much activity from oil companies until the fourth quarter. The line-pipe market is stagnant with mills looking to export quarters for orders.

Stainless Wire — The Stainless Steel Div. of Jones & Laughlin begins production next month of stainless wire at its new mill in Detroit. Product produced will range in size from ⅛ in. to ½ in. in coils or straight lengths. Four finishes will be available: cold drawn; copper-coated and cold drawn; special non-metallic coatings; and centerless ground. Wire will be offered in standard types of both the 300 and 400 stainless steel grades.

Warehouses—The mild flurry of inventory buying by **Midwestern** outlets this month seems to be ending. Most distributors there indicate they will hold stocks at present levels through April and probably May. The suppliers indicate a mild seasonal pickup in light angles.

Pittsburgh warehouses report March orders show no improvement over those of February. The sales manager of a large **West Coast** outlet sums things up this way: "Today, steel users who depended on warehouses for some 20 pct or more of their normal tonnage are turning to the mills for 95 pct of their needs. If a sizeable increase in business comes through, watch for the mills to get it first."

Iron Ore—This is the first year that taconite pellets in production size quantities will be offered for sale on the open market. Oglebay Norton Co. of **Cleveland** has been appointed exclusive sales agent for 1½ million tons of 61 pct Fe pellets from the Reserve Mining Co. at Silver Bay, Minn.

PURCHASING AGENT'S CHECKLIST

Primary price of aluminum drops first time in 17 years. **P. 53**

Valuable group of materials created by combining properties of metal and plastics. **P. 56**

Using aluminum impacts opens new design areas. **P. 98**

COMPARISON OF PRICES

(Effective April 1, 1958)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in **Heavy Type**; declines appear in *Italics*.

	Apr. 1 1958	Mar. 25 1958	Mar. 4 1958	Apr. 2 1957
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.925¢	4.925¢	4.925¢	4.675¢
Cold-rolled sheets	6.05	6.05	6.05	5.75
Galvanized sheets (10 ga.)	6.60	6.60	6.60	6.30
Hot-rolled strip	4.925	4.925	4.925	4.675
Cold-rolled strip	7.17	7.17	7.17	6.870
Plate	5.12	5.12	5.12	4.87
Plates, wrought iron	13.15	13.15	13.15	10.40
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	50.00
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$10.30	$10.30	$10.30	$9.95
Tin plates, electro (0.50 lb.)	9.00	9.00	9.00	8.65
Special coated mfg. ternes	9.55	9.55	9.55	9.20
Bars and Shapes: (per pound)				
Merchant bar	5.425¢	5.425¢	5.425¢	5.075¢
Cold finished bars	7.30	7.30	7.30	6.85
Alloy bars	6.475	6.475	6.475	6.125
Structural shapes	5.275	5.275	5.275	5.00
Stainless bars (No. 302)	45.00	45.00	45.00	43.25
Wrought iron bars	14.45	14.45	14.45	11.50
Wire: (per pound)				
Bright wire	7.65¢	7.65¢	7.65¢	7.20¢
Rails: (per 100 lb.)				
Heavy rails	$5.525	$5.525	$5.525	$5.275
Light rails	6.50	6.50	6.50	6.25
Semifinished Steel: (per net ton)				
Rerolling billets	$77.50	$77.50	$77.50	$74.00
Slabs, rerolling	77.50	77.50	77.50	74.00
Forging billets	96.00	96.00	96.00	91.50
Alloy blooms, billets, slabs	114.00	114.00	114.00	107.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.15¢	6.15¢	6.15¢	5.80¢
Skelp	4.875	4.875	4.875	4.225
Finished Steel Composite: (per pound)				
Base price	5.967¢	5.967¢	5.967¢	5.670¢

	April 1 1958	March 25 1958	March 4 1958	April 2 1957
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.97	$70.97	$70.97	$68.88
Foundry, Valley	66.50	66.50	66.50	65.00
Foundry, Southern Cin'ti	73.87	73.87	73.87	67.17
Foundry, Birmingham	62.50	62.50	62.50	59.00
Foundry, Chicago	66.50	66.50	66.50	65.00
Basic, del'd Philadelphia	70.47	70.47	70.47	68.38
Basic, Valley furnace	66.00	66.00	66.00	64.50
Malleable, Chicago	66.50	66.50	66.50	65.00
Malleable, Valley	66.50	66.50	66.50	65.00
Ferromanganes, 74-76 pct Mn, cents per lb‡	12.25	12.25	12.25	12.75
Pig Iron Composite: (per gross ton)				
Pig iron	$66.49	$66.49	$66.49	$64.56
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$34.50	$34.50	$37.50	$42.50
No. 1 steel, Phila. area	38.00	38.00	38.00	49.50
No. 1 steel, Chicago	*29.50*	32.50	37.50	40.50
No. 1 bundles, Detroit	*24.50*	27.50	31.50	34.50
Low phos., Youngstown	*34.50*	35.50	41.00	41.50
No. 1 mach'y cast, Pittsburgh	51.50	51.50	51.50	49.50
No. 1 mach'y cast, Phila.	49.50	49.50	48.50	55.50
No. 1 mach'y cast, Chicago	*46.50*	48.50	48.50	45.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	*$34.00*	$35.00	$37.67	$44.17
No. 2 bundles	*25.17*	26.17	28.50	35.83
Coke Connellsville: (per net ton at oven)				
Furnace coke, prompt	$15.38	$15.38	$15.38	$15.38
Foundry coke, prompt	$17.50-$19	$17.50-$19	$17.50-$19	$17.50-$19
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	25.00	25.00	25.00	32.00
Copper, Lake, Conn.	25.00	25.00	25.00	32.00
Tin, Straits, N. Y.	*93.25*†	93.625*	94.75	98.875
Zinc, East St. Louis	10.00	10.00	10.00	13.50
Lead, St. Louis	12.80	12.80	12.80	15.80
Aluminum, virgin ingot	28.10	28.10	28.10	27.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	33.00

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

INDEX TO PRICE PAGES

Prices At a Glance 135
Comparison of Prices 139
Bars 149
Billets, Blooms and Slabs 147
Boiler Tubes 152
Bolts, Nuts, Rivets, Screws 151
Clad Steel 152
Coke 152
Electrical Sheets 152
Electrodes 152
Electroplating Supplies 151
Ferroalloys 154
Iron Ore 152
Merchant Wire Products 152
Metal Powders 151
Nonferrous
- Mill products 146
- Primary prices 135-145-146
- Remelted metals 146
- Scrap 146

Pig Iron 153
Pipe and Tubing 150
Plates 149
Rails 152
Refractories 152
Shapes 147
Sheets 148
Spring Steel 152
Stainless 153
Steel Scrap 142
Strip 147
Structurals 147
Tinplate 148
Tool Steel 152
Track Supplies 152
Warehouse Prices 151
Water Pipe Index 151
Wire 149
Wire Rod 148

COWLES

ROTARY KNIVES

SLITTING KNIFE

TRIMMING KNIFE

CARBIDE KNIFE

SPACER

Specify Cowles—world's largest manufacturer of rotary knives—to get more tonnage per grind, and cut production costs. Our exceedingly high standards of precision manufacture and exacting heat treatment assure utmost accuracy, efficiency and long life. Complete line including slitting, trimming and specially engineered knives, in our **Max-cut; Specialloy; Superalloy; Circle C** and **Super C** grades—also carbide knives — for any requirement. Prompt delivery. Engineering help on any job. **Let Cowles quote on your requirements.**

Write for Bulletin No. 571 Today!

COWLES TOOL COMPANY

2060 WEST 110th STREET, CLEVELAND 2, OHIO

REPRESENTATIVES IN ALL PRINCIPAL CITIES

Little Buying Set In Second Quarter

Some mills threaten to stay out of the market through the entire second quarter.

At best, only moderate buying is scheduled in view of sinking operating rates.

▪ The market kept up its retreat, with substantial declines in Chicago leading the way.

Although price declines were not universal, most prices that held were poised uncertainly on the edge of apparent further drops.

Lower automotive list prices were typical of the general weak tone in the market. Declining steel operating rates added to the deep gloom that now covers the market.

In Detroit, especially, the local market has virtually dried up with mills operating at their lowest rates in years. Elsewhere, scrap consumers are talking about staying out of the market through the entire second quarter.

Only a few in the trade believe such talk is bluffing. Mills are not sitting on any record tonnage and scrap is not plentiful. But there is little incentive for mills to lay down larger supplies, even at present bargain prices.

Pittsburgh — Prices of most grades are unchanged as trading continues at a low ebb. Industrial lists and scattered mill purchases show weakness. Local factory bundles went for $3 to $5 under last month's price. A local mill bought a quantity of good No. 1 bundles for $35 and dropped its price for No. 2 bundles to $25. A mill on the fringe is offering prices equal to $34 in Pittsburgh for No. 1 heavy melting, $30 for No. 2 heavy melting, and $27 for No. 2 bundles.

Chicago—The market continues to sink in absence of strong mill buying. Older, higher priced orders continue to soak up some scrap, but mills are able to purchase at sharply reduced prices. The general drop has spread to include railroad and cast grades. Some grades suffered their worst drop in recent weeks. Although factory bundle lists closed at $37 to $39, mills were already dropping offering prices at the end of the week. No. 1 factory bundles were incorrectly quoted in March 27 issue. Correct price was $37 to $38.

Philadelphia—It won't take much to knock the pins from under this market. No. 2 bundles are down $1 on the basis of a sale. Other steelmaking grades are holding by a thread. Cast prices are shaky. While there has been no business in turnings for weeks, quoted prices are regarded as the bottom for these grades. The shakiness reflects recent price drops in the Midwest and fading export prospects in this district. Price of cast iron car wheels, was quoted incorrectly last week. Correct price is $45 to $46.

New York — Lack of domestic business has enabled export buyers to fill latest orders for openhearth grades $2 under earlier prices. Top for No. 1 heavy melting is now $32. Stainless grades fell $5 to $10, depending on grade, in a very weak market. Turnings and cast are unchanged, although there is an almost complete lack of business.

Detroit — Shutdown of another steel mill this week has had a demoralizing effect on dealers. Virtually without prospects for a purchase locally this month, dealers are approaching the frantic point, financially and emotionally.

Cleveland — The market settled another $1 on appraisal as mills show no interest in buying this month. Drop in auto lists made many more dealers willing to sell at lower prices. An additional drop of $1 or more is in prospect. Low phos punchings and plate was incorrectly quoted in April 3 issue. Correct price was $32 to $33.

St. Louis—Mills in the St. Louis district continue to buy at unchanged prices, despite softness in other markets. However, railroad specialties, standard steel cars axles, stove plate and unstripped motor blocks are off $1.

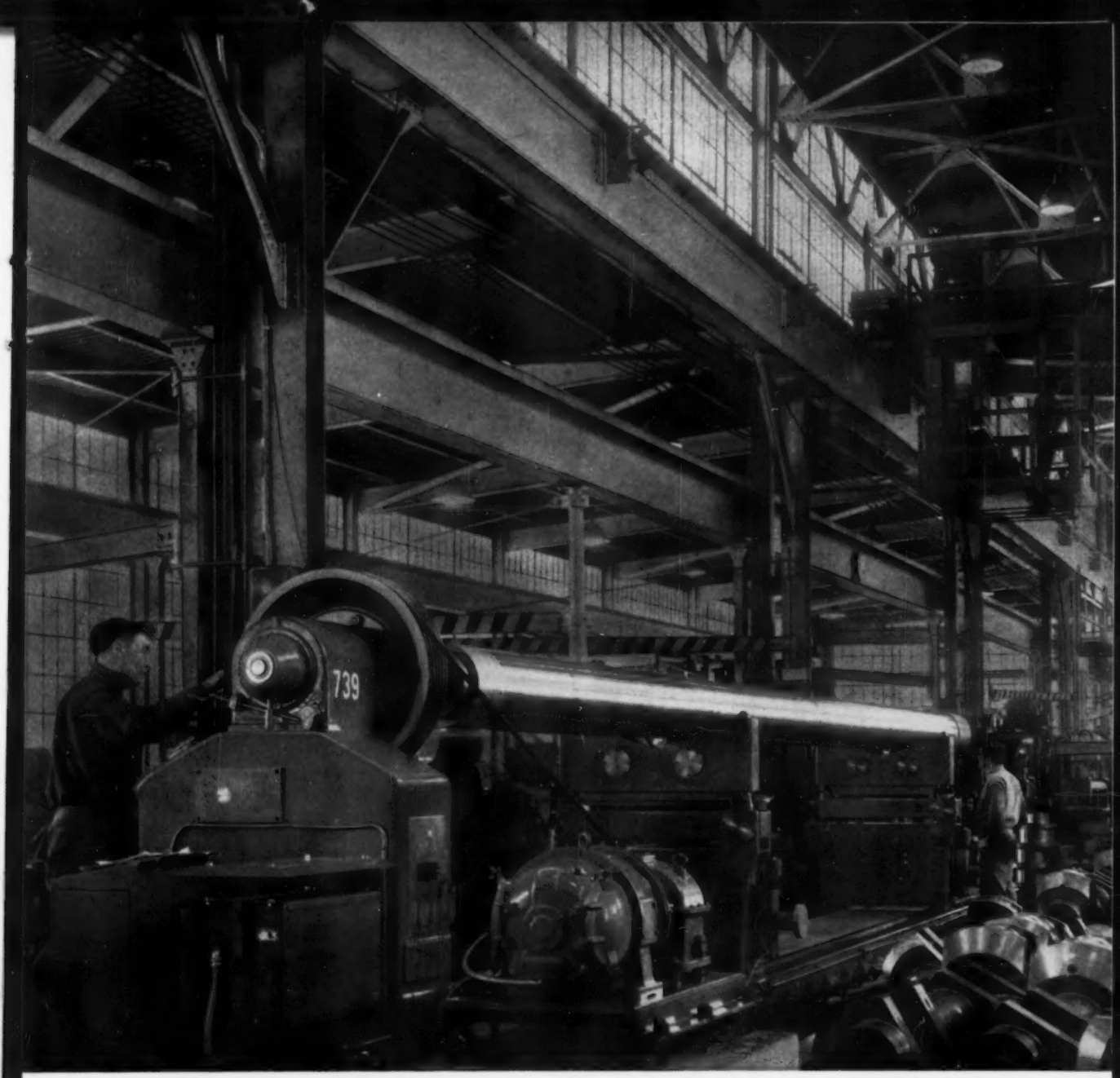
Birmingham — With the exception of a few cast consumers, there is almost a complete absence of scrap buying in this territory. Some sales for export at an average price of $30 are reported along the Gulf coast.

Cincinnati—The market dropped $2.50 to $4 on new monthly prices of moderate tonnage to area consumers. Dealers are reluctant to sell, but are unloading spot tonnage.

Buffalo—Business here is virtually dead. The general tone of the market is weaker, but some dealers say they would rather hold on to their scanty supplies than sell at today's low prices.

Boston — Blast furnace and secondary steelmaking grades dropped this week on appraisal. Lack of buying forced brokers and dealers to devalue the market on the basis of what consumers would be willing to pay.

West Coast—Prices are steady. Seattle shows signs of strength. Scrap flow is slow. Mills have little interest in No. 2 bundles.



WHO FORGES THE TOUGH ONES?
and dynamic balances them, too?

To further National Forge's reputation for producing precise forgings, we've installed one of the largest, most accurate dynamic balancing machines in use. Our American-Trebel has a 33,000-pound, 60-foot capacity.

Pictured on the machine is a 42 ft. propeller shaft that has been forged, machined, and hollow bored—all operations done in our National Forge plant. NFO specialists are shown balancing this 15,500 lb. shaft to within 730 ounce-inches in two planes.

If you want one responsible source to produce and control the quality of your forgings . . . from melting and forging the steel through machining and dynamic balancing . . . call National Forge. Let us quote on your next job—and *prove* "who forges and dynamic balances the tough ones . . . best!"

NATIONAL FORGE & ORDNANCE COMPANY
IRVINE, WARREN COUNTY, PA.

For information on the "tough" ones and the machinery that makes them best, write for Bulletin NFO 1.

SCRAP PRICES *(Effective April 1, 1958)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	34.00 to 35.00
No. 1 factory bundles	38.00 to 39.00
No. 2 bundles	26.00 to 27.00
No. 1 busheling	34.00 to 35.00
Machine shop turn.	16.00 to 17.00
Mixed bor. and ms. turn.	16.00 to 17.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	20.00 to 21.00
Low phos. punch'gs plate	38.00 to 39.00
Heavy turnings	30.00 to 31.00
No. 1 RR hvy. melting	38.00 to 39.00
Scrap rails, random lgth.	50.00 to 51.00
Rails 2 ft and under	54.00 to 55.00
RR steel wheels	47.00 to 48.00
RR spring steel	47.00 to 48.00
RR couplers and knuckles	47.00 to 48.00
No. 1 machinery cast.	51.00 to 52.00
Cupola cast.	44.00 to 45.00
Heavy breakable cast.	42.00 to 43.00
Stainless	
18-8 bundles and solids	180.00 to 185.00
18-8 turnings	105.00
430 bundles and solids	110.00 to 115.00
410 turnings	60.00

Chicago

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 dealer bundles	29.00 to 30.00
No. 1 factory bundles	35.00 to 36.00
No. 2 bundles	22.00 to 23.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	16.00 to 17.00
Mixed bor. and turn.	18.00 to 19.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	18.00 to 19.00
Low phos. forge crops	45.00 to 46.00
Low phos. punch'gs plate	38.00 to 39.00
Low phos. 3 ft and under	36.00 to 37.00
No. 1 RR hvy. melting	35.00 to 36.00
Scrap rails, random lgth.	45.00 to 46.00
Rerolling rails	53.00 to 54.00
Rails 2 ft and under	50.00 to 51.00
Locomotive tires cut	44.00 to 45.00
Cut bolsters & side frames	41.00 to 42.00
Angles and splice bars	45.00 to 46.00
RR steel car axles	53.00 to 54.00
RR couplers and knuckles	41.00 to 42.00
No. 1 machinery cast	46.00 to 47.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	37.00 to 38.00
Cast iron brake shoe	37.00 to 38.00
Cast iron wheels	34.00 to 35.00
Malleable	50.00 to 51.00
Stove plate	37.00 to 38.00
Steel car wheels	41.00 to 42.00
Stainless	
18-8 bundles and solids	170.00 to 175.00
18-8 turnings	95.00 to 100.00
430 bundles and solids	100.00 to 110.00
430 turnings	50.00 to 55.00

Philadelphia Area

No. 1 hvy. melting	$37.50 to $38.50
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	37.50 to 38.50
No. 2 bundles	26.00 to 27.00
No. 1 busheling	37.50 to 38.50
Machine shop turn.	18.00 to 19.00
Mixed bor. short turn.	19.00 to 20.00
Cast iron borings	20.00 to 21.00
Shoveling turnings	20.00 to 21.00
Clean cast. chem. borings	32.00 to 33.00
Low phos. 5 ft and under	41.00 to 42.00
Low phos. 2 ft and under	43.00 to 44.00
Low phos. punch'gs	43.00 to 44.00
Elec. furnace bundles	38.00 to 39.00
Heavy turnings	33.00 to 34.00
RR steel wheels	45.00 to 46.00
RR spring steel	45.00 to 46.00
Rails 18 in. and under	58.00 to 60.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	43.00 to 44.00
Cast iron car wheels	45.00 to 46.00
Malleable	60.00 to 62.00
Unstripped motor blocks	32.00 to 33.00
No. 1 machinery cast.	49.00 to 50.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$29.50 to $30.50
No. 2 hvy. melting	26.50 to 27.50
No. 1 dealer bundles	29.50 to 30.50
No. 2 bundles	20.00 to 21.00
Machine shop turn.	11.50 to 12.50
Mixed bor. and turn.	11.50 to 12.50
Shoveling turnings	14.00 to 15.00
Cast iron borings	11.50 to 12.50
Low phos, 18 in. and under	36.00 to 37.00
Rails, random length	43.00 to 44.00
Rails, 18 in. and under	51.00 to 52.00
No. 1 cupola cast.	39.00 to 40.00
Hvy. breakable cast.	32.00 to 33.00
Drop broken cast.	45.00 to 46.00

Cleveland

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	30.00 to 31.00
No. 1 factory bundles	34.00 to 35.00
No. 2 bundles	21.00 to 22.00
No. 1 bushelings	30.00 to 31.00
Machine shop turn.	10.50 to 11.50
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Cut structural & plates, 2 ft & under	38.00 to 39.00
Drop forge flashings	30.00 to 31.00
Low phos. punch'gs plate	31.00 to 32.00
Foundry steel, 2 ft & under	35.00 to 36.00
No. 1 RR heavy melting	38.00 to 39.00
Rails 2 ft and under	53.00 to 54.00
Rails 18 in. and under	54.00 to 55.00
Railroad grate bars	14.00 to 15.00
Steel axle turnings	17.00 to 18.00
Railroad cast.	46.00 to 47.00
No. 1 machinery cast.	45.00 to 46.00
Stove plate	42.00 to 43.00
Malleable	58.00 to 59.00
Stainless	
18-8 bundles	165.00 to 170.00
18-8 turnings	90.00 to 95.00
430 bundles	95.00 to 100.00
430 turnings	40.00 to 45.00

Buffalo

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	25.50 to 26.50
No. 1 busheling	28.00 to 29.00
No. 1 dealer bundles	28.00 to 29.00
No. 2 bundles	22.50 to 23.50
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	15.00 to 16.00
Cast iron borings	14.00 to 15.00
Low phos. plate	34.00 to 35.00
Structurals and plate, 2 ft and under	37.00 to 38.00
Scrap rails, random lgth.	40.00 to 41.00
Rails 2 ft and under	50.00 to 51.00
RR steel wheels	37.00 to 38.00
RR spring steel	33.00 to 34.00
RR couplers and knucklers	33.00 to 34.00
No. 1 machinery cast.	46.00 to 47.00
No. 1 cupola cast.	42.00 to 43.00

St. Louis

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	25.00 to 26.00
Machine shop turn.	19.00 to 20.00
Cast iron borings	21.00 to 22.00
Shoveling turnings	21.00 to 22.00
No. 1 RR hvy. melting	37.00 to 38.00
Rails, random lengths	48.00 to 49.00
Rails, 18 in. and under	54.00 to 55.00
Angles and splice bars	47.00 to 48.00
Std. steel car axles	51.00 to 52.00
RR specialties	43.00 to 44.00
Cupola cast.	45.00 to 46.00
Heavy breakable cast.	32.00 to 33.00
Cast iron brake shoes	37.00 to 38.00
Stove plate	38.00 to 39.00
Cast iron car wheels	37.00 to 38.00
Rerolling rails	57.00 to 58.00
Unstripped motor blocks	34.00 to 35.00

Birmingham

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	33.00 to 34.00
Machine shop turn.	24.00 to 25.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	12.00 to 13.00
Electric furnace bundles	37.00 to 38.00
Elec. furnace, 3 ft & under	36.00 to 37.00
Bar crops and plate	39.00 to 40.00
Structural and plate, 2 ft	39.00 to 40.00
No. 1 RR hvy. melting	36.00 to 37.00
Scrap rails, random lgth.	45.00 to 46.00
Rails, 18 in. and under	49.00 to 50.00
Angles & splice bars	43.00 to 44.00
Rerolling rails	52.00 to 53.00
No. 1 cupola cast.	51.00 to 52.00
Stove plate	49.00 to 50.00
Charging box cast.	22.00 to 23.00
Cast iron car wheels	38.00 to 39.00
Unstripped motor blocks	40.00 to 41.00

Youngstown

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	12.00 to 13.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Low phos. plate	34.00 to 35.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	27.00 to 28.00
No. 2 dealer bundles	18.00 to 20.00
Machine shop turn.	11.00 to 12.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	15.00 to 16.00
Clean cast. chem. borings	25.00 to 26.00
No. 1 machinery cast.	35.00 to 36.00
Mixed yard cast.	34.00 to 35.00
Charging box cast.	32.00 to 33.00
Heavy breakable cast.	32.00 to 33.00
Unstripped motor blocks	27.00 to 28.00
Stainless	
18-8 prepared solids	145.00 to 150.00
18-8 turnings	50.00 to 55.00
430 prepared solids	70.00 to 75.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$24.00 to $25.00
No. 2 hvy. melting	19.00 to 20.00
No. 1 dealer bundles	25.00 to 26.00
No. 2 bundles	14.00 to 15.00
No. 1 busheling	24.00 to 25.00
Drop forge flashings	22.00 to 23.00
Machine shop turn.	8.00 to 9.00
Mixed bor. and turn.	9.00 to 10.00
Shoveling turnings	10.00 to 11.00
Cast iron borings	10.00 to 11.00
Low phos. punch'gs plate	24.00 to 25.00
No. 1 cupola cast.	34.00 to 35.00
Heavy breakable cast.	24.00 to 25.00
Stove plate	29.00 to 30.00
Automotive cast.	35.00 to 36.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$27.00 to $28.00
No. 2 hvy. melting	22.00 to 23.00
No. 1 dealer bundles	26.00 to 27.00
No. 2 bundles	15.00 to 16.00
No. 1 busheling	26.00 to 27.00
Elec. furnace, 3 ft & under	31.00 to 32.00
Machine shop turn.	8.00 to 9.00
Mixed bor. and short turn.	9.00 to 10.00
Shoveling turnings	10.00 to 11.00
Clean cast. chem. borings	19.00 to 20.00
No. 1 machinery cast.	34.00 to 35.00
Mixed cupola cast.	29.00 to 30.00
Heavy breakable cast.	29.00 to 30.00
Stove plate	26.00 to 27.00
Unstripped motor blocks	26.00 to 27.00

San Francisco

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	30.00
No. 1 dealer bundles	28.00
No. 2 bundles	22.00
Machine shop turn.	15.00
Cast iron borings	15.00
No. 1 RR hvy. melting	32.00
No. 1 cupola cast.	40.00

Los Angeles

No. 1 hvy. melting	$34.00
No. 2 hvy. melting	32.00
No. 1 dealer bundles	30.00
No. 2 bundles	22.00
Machine shop turn.	$9.00 to 11.00
Shoveling turnings	11.00 to 13.00
Cast iron borings	11.00 to 13.00
Elec. furn. 1 ft and under (foundry)	45.00
No. 1 RR hvy. melting	36.00
No. 1 cupola cast.	41.00 to 43.00

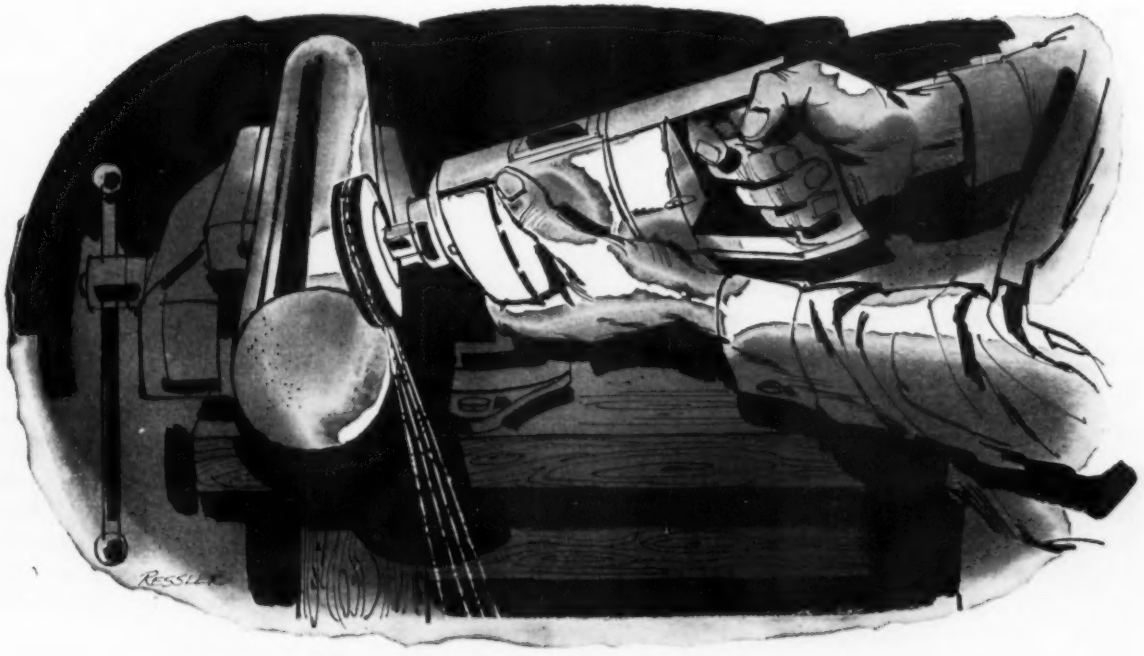
Seattle

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	30.00
No. 2 bundles	24.00
No. 1 cupola cast.	36.00
Mixed yard cast.	36.00

Hamilton, Ont.

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	28.00
No. 1 dealer bundles	32.00
No. 2 bundles	25.00
Mixed steel scrap	27.00
Busheling	32.00
Bush., new fact. prep'd	32.00
Bush., new fact, unprep'd	26.00
Machine shop turn.	17.00
Short steel turn.	21.00
Mixed bor. and turn.	17.00
Rails, rerolling	41.00
Cast scrap	$44.00 to 47.00

S-E-G-R-E-G-A-T-E-D SCRAP IS WORTH MORE



In diffused daylight, so that spark characteristics can be accurately observed, hold a sample against a clean grinding wheel revolving at high speed. A low volume spark stream of reddish-orange color with disjointed lines indicates tungsten high speed steel. It is well to have known sample for comparison.

Here is how to test for

TUNGSTEN HIGH SPEED TOOL STEEL

Although its tonnage represents a fraction of the total annual steel production, the dollar value of tungsten high speed steel is exceptionally high. For high speed steels are the aristocrats of the tool steel industry. T1, the 18-4-1 high speed steel (18% tungsten, 4% chromium, 1% vanadium) is used primarily for cutting tools and occupies an important place in modern machinery operations. Unsegregated tungsten high speed steel is worth no more than the going price for ordinary scrap; segregated, it commands a premium price. To satisfy present needs for scrap of known analysis, our personnel, equipment, experience and strategically located facilities are specifically geared for the purchase or sale of dependably segregated alloy scrap. We welcome your inquiry.

Luria Brothers and Company, Inc.

MAIN OFFICE • PHILADELPHIA NATIONAL BANK BUILDING, PHILADELPHIA 7, PENNSYLVANIA.

BRANCH OFFICES • BIRMINGHAM, ALA. • BOSTON, MASS. • BUFFALO, N. Y. • CHICAGO, ILLINOIS • CINCINNATI, OHIO • CLEVELAND, OHIO • DETROIT, MICHIGAN • HOUSTON, TEXAS • KOKOMO, INDIANA • LEBANON, PENNA. • LOS ANGELES, CAL. • MEMPHIS, TENN. • NEW YORK, N.Y. • PITTSBURGH, PENNA. • PHILADELPHIA, PENNA. • PUEBLO, COLORADO • READING, PENNA. • ST. LOUIS, MISSOURI • SAN FRANCISCO, CALIF. • SEATTLE, WASH. • *In Canada* • MONTREAL, QUEBEC—HAMILTON, ONTARIO

PLANTS • LEBANON, PENNA. • READING, PENNA. • MODENA, PENNA. • DETROIT (ECORSE), MICHIGAN • PITTSBURGH, PENNA. • ERIE, PENNA.

IMPORT & EXPORT—LIVINGSTON & SOUTHARD, INC., 99 Park Ave., New York, N.Y. • Cable Address: FORENTRACO

The Case On Brass Mill Imports

U. S. mills ask ad valorem tariff to take the sting out of import competition.

Importers' spokesman says U. S. market troubles are not caused by imports.

▪ Is the growing volume of imported copper and brass mill products a serious problem to domestic mills?

U. S. brass mills have been answering "yes," individually and through their industry organ, Copper and Brass Research Assn., almost since business started to turn sour in 1957.

Ad Valorem—The latest suggestion from T. E. Veltfort, managing director, CABRA, is a tariff based on an ad valorem rate rather than on a specific duty. The ad valorem rate would be based on 1934 values, and could be increased up to 50 pct.

The CABRA director also wants to eliminate the necessity of showing a casual connection between increased imports and trade agreement concessions in order to use the "escape clause" in the current Trade Agreement Act. This clause permits a country to up tariffs where imports are hurting an essential domestic industry, despite agreements to the contrary.

Importers Say—The other side of the story has been aired recently by Walter S. Guggenheim, representing the American Importers of Brass & Copper Mill Products, Inc. The recently formed group says its 17 members import about 75 pct of the brass and copper mill products coming into the U. S.

The importers' spokesman has a nine-point slate in opposing any action that would hike tariffs. The most significant of his contentions are (1) The U. S. copper and brass industry has doubled production and sales over pre-war levels, while imports have risen to only 5 pct of U. S. output. (2) Wage differentials between U. S. and foreign brass mills are offset by other costs. (3) Copper is hurting not because of imports but because of substitution of other materials.

Market Share — Mr. Veltfort places imports' share of the U. S. market at 6 pct. But, he says that in some items, such as thin wall brass tube, imports have 80 pct of the domestic market. Mr. Guggenheim's reaction is that imports have made the most headway where high U. S. prices left the door open.

Mr. Guggenheim disputes the importance of wage differences because importers have 6¢ per lb costs for ocean freight, handling, insurance, etc. that domestic mills do not. He offers an example of a Canadian mill, with a similar wage scale to the U. S. underselling U. S. mills on copper tubing by 6¢ per ft.

Zinc

The government announced, early this week, that it has reached its stockpile objectives for zinc. General Services Administration officially closed the purchase program with March purchases. These are to be delivered by May 15. The trade is estimating the last purchase was about 20 pct below the previous month.

Magnesium

Shipments of magnesium castings in January 1958 were up 23 pct over the previous month, says the Magnesium Assn., but still trailed January 1957 by a disappointing 46 pct.

All types of castings followed the overall pattern.

	Jan. 1958	Dec. 1957	Jan. 1957
Sand	423	400	771
Perm. Mold	52	43	113
Anodes	346	208	528
Die	120	116	192
Total (short tons)	940	767	1604

The Magnesium Assn. also released its statistics for 1957. Only primary ingot production topped the year before. Shipments of both wrought products and castings were

Monthly Average Metal Prices

(Cents per lb except as noted)

Average prices of the major nonferrous metals in March based on quotations appearing in THE IRON AGE, were as follows:

Electrolytic copper, del'd Conn. Valley	25.00
Copper, Lake	25.00
Straits Tin, New York	94.423
Zinc, E. St. Louis	10.00
Lead, St. Louis	12.80
Aluminum ingot	28.10

Note: Quotations are going prices

Primary Prices

cents per lb)	Current price	last price	date of change
Aluminum pig	24.00	26.00	4/1/58
Aluminum ingot	28.10	27.10	8/1/57
Copper (E)	25.00	27.00	1/13/58
Copper (CS)	24.00	23.50	3/24/58
Copper (L)	25.00	27.00	1/13/58
Lead, St. L.	12.80	13.30	12/2/57
Lead, N. Y.	13.00	13.50	12/2/57
Magnesium ingot	36.00	34.00	8/13/58
Magnesium pig	35.25	33.75	8/13/58
Nickel	74.00	64.50	12/6/56
Titanium sponge	200-250	165-250	1/29/58
Zinc, E. St. L.	10.00	10.50	7/1/57
Zinc, N. Y.	10.50	11.00	7/1/57

ALUMINUM: 99% ingot frt allwd. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colbourne, Canada. ZINC: prime western. TIN: see next page; other primary prices, pg. 146.

off. Both were about on a par with 1956 in the earlier months of 1957 but tailed off, castings in August, wrought in June.

	1957	1956
Castings	**15,166**	**18,083**
Wrought	**10,959**	**12,692**
Ingot prod. (short tons)	**78,865**	**68,347**

Copper

A spokesman for one of the Big 3 copper producers says about the current condition of the market, "We've got our fingers crossed." The reports they are getting point to an upturn in business. But this producer hasn't felt it to any extent yet.

A major custom smelter calls his 24¢ price for copper "firm and steady." He reports some tapering off when the price was boosted from 23.5¢ per lb. But the apparent level buying has hit is considered encouraging. Most smelters caution from where they sit improvement in their customers' business appears to be spotty and on a small scale.

Brass mills say they notice little if any improvement. But the feeling is strong that the bottom has definitely been reached. The difference in opinion arises on when the upturn will come.

Lead

The government is still in the market. But, a spokesman for the Office of Defense Mobilization says the stockpile will probably be full by about mid-year.

The Bureau of Mines reports domestic mine output in 1957 dropped to 333,500 tons from 352,800 tons in 1956. Average in the first four months topped 1956 average. But output at the year's end tailed off badly due to the oversupply and the falling price.

Tin prices for the week—Mar. 26—93.50; Mar. 27—93.50; Mar. 28—93.125; Mar. 31—93.00; Apr. 1—93.25.*

* Estimate

SHEPARD NILES

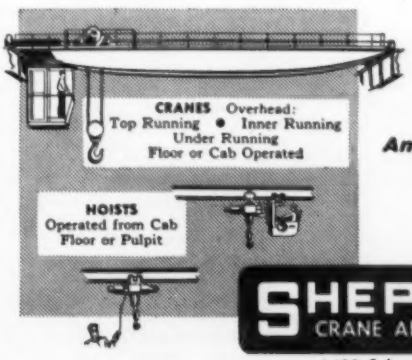
MONORAIL HOIST

MORE ROOM

...for production and storage

Why move materials around men, materials and machines? Use the direct route — smoothly and safely — through air. Shepard Niles Monorail Hoists and Transfer Cranes put load handling overhead . . . eliminate costly ground level handling. Use the space saved for production and storage.

Rugged Shepard Niles hoists are available for constant or intermittent service. Choose from light, medium or heavy duty hoists equipped with cab or floor controls. Offered in fast, medium or slow speeds. Send for Monorail Hoist bulletin today . . . or ask that a Shepard Niles representative call — there's NO OBLIGATION.



Building
America's Most Complete Line of Cranes and Hoists Since 1903

SHEPARD NILES
CRANE AND HOIST CORPORATION
1492 Schuyler Ave., Montour Falls, N. Y.

NONFERROUS PRICES

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate

("F" temper except 6061-0)

Alloy	.032	.081	.136-.249	.250-3.
1100, 3003	46.6	44.3	43.6	42.7
5052	54.0	48.9	47.2	45.4
6061-0	51.4	47.0	45.2	45.1

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6-8	45.0-46.8	60.4-64.1
12-14	45.7-47.2	61.3-65.8
24-26	49.0-49.5	72.1-76.8
36-38	58.0-58.6	96.2-99.8

Screw Machine Stock—2011-T-3

Size"	¼	⅜-⅝	⅞-1	1¼-1½
Price	63.0	62.5	61.0	58.6

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.420	$1.893	$2.367	$2.839
.024 gage	1.774	2.366	2.957	3.549

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250 3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade	....	67.9	69.0	77.9	108.1
AZ31B Spec.	.....	93.3	95.7	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade. (AZ31C)	69.6	70.7	75.6	89.2
Spec. Grade... (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	126	106	128
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	120	105	121
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	48.13	.....	45.36	48.32
Brass, 70/30	42.69	43.23	42.63	45.60
Brass, Low	44.90	45.44	44.84	47.71
Brass, R L	45.67	46.21	45.61	48.48
Brass, Naval	47.07	.....	41.38	50.48
Munts Metal	45.19	.....	41.00	.....
Comm. Bs.	46.98	47.52	46.92	49.54
Mang. Bs.	50.81	.....	44.91	.....
Phos. Bs. 5%	67.17	.....	67.67	.....

Free Cutting Brass Rod 31.03

TITANIUM

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, $9.50-$10.60; alloy, $14.75; Plate, HR, commercially pure, $8.00-$8.75; alloy, $10.75. Wire, rolled and/or drawn, commercially pure, $7.50-$8.00; alloy, $10.00. Bar, HR or forged, commercially pure, $6.15-$6.40; alloy, $6.15-$6.35; billets, HR, commercially pure, $6.00-$6.25; alloy, $6.00-$6.20.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 29.50
Beryllium aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.55
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic basis... $ 1.31
Cobalt, 97-99% (per lb)....$2.00 to $2.07
Germanium, per gm, f.o.b. Miami, Okla., refined ..... 39.50 to 50.00
Gold, U. S. Treas, per troy oz..... $35.00
Indium, 99.9%, dollars per troy oz..$ 2.25
Iridium, dollars per troy oz. ...$80 to $90
Lithium, 98% .....$11.00 to $14.00
Magnesium, sticks, 100 to 500 lb.... 59.00
Mercury, dollars per 76-lb flask, f.o.b. New York .....$233 to $237
Nickel oxide sinter at Copper Cliff, Ont., contained nickel 71.25
Palladium, dollars per troy oz...$19 to $21
Platinum, dollars per troy oz...$72 to $75
Rhodium .....$120.00 to $125.00
Silver ingots (¢ per troy oz.)..... 88.625
Thorium, per kg. $43.00
Vanadium .....$ 3.45
Zirconium sponge .....$ 5.00

Remelted Metals

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
No. 115 ..... 24.75
No. 120 ..... 23.75
No. 123 ..... 23.00
80-10-10 ingot
No. 305 ..... 28.75
No. 315 ..... 26.75
88-10-2 ingot
No. 210 ..... 35.75
No. 215 ..... 31.50
No. 245 ..... 28.25
Yellow ingot
No. 405 ..... 20.75
Manganese bronze
No. 421 ..... 22.50

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper max. 24.75-25.75
0.60 copper max. 24.50-25.50
Piston alloys (No. 122 type)...23.75-24.50
No. 12 alum. (No. 2 grade)...21.00-21.75
108 alloy 21.50-22.25
195 alloy 24.00-25.50
13 alloy (0.60 copper max.)...24.50-25.50
AXS-679 (1 pct zinc) 21.25-22.25

(Effective March 31, 1958)

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97½% 23.00-24.00
Grade 2—92-95% 21.00-21.75
Grade 3—90-92% 20.00-20.75
Grade 4—85-90% 17.50-18.50

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	21	20¼
Yellow brass	16⅛	14⅞
Red brass	18⅝	17⅞
Comm. bronze	19¼	18⅛
Mang. bronze	14⅞	14⅛
Yellow brass rod ends	15⅞	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 19¾
No. 2 copper wire 18¼
Light copper 16
*Refinery brass 17¾
Copper bearing material 17
*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 19¾
No. 2 copper wire 18¼
Light copper 16
No. 1 composition 17¾
No. 1 comp. turnings 17¼
Hvy. yellow brass solids 13
Brass pipe 15
Radiators 14¼
Aluminum
Mixed old cast. ..... 12½—13½
Mixed new clips ..... 14½—15½
Mixed turnings, dry ..... 13 —14

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 17½—18
No. 2 copper wire ..... 15½—16
Light copper ..... 13½—14
Auto radiators (unsweated).. 11 —11⅛
No. 1 composition ..... 14½—15
No. 1 composition turnings.. 13½—14
Cocks and faucets ..... 12 —12½
Clean heavy yellow brass .... 10 —10½
Brass pipe ..... 12 —12½
New soft brass clippings .... 13 —13½
No. 1 brass rod turnings .... 10½—11

Aluminum

Alum. pistons and struts .... 5½— 6
Aluminum crankcases ..... 10 —10½
1100 (2S) aluminum clippings 13 —13½
Old sheet and utensils ..... 10 —10½
Borings and turnings ..... 6½— 7
Industrial castings ..... 10 —10½
2024 (24S) clippings ..... 11½—12

Zinc

New zinc clippings ..... 4 — 4½
Old zinc ..... 3 — 3¼
Zinc routings ..... 1¾— 2
Old die cast scrap ..... 1½— 1¾

Nickel and Monel

Pure nickel clippings 42-45
Clean nickel turnings 37-40
Nickel anodes 42-45
Nickel rod ends 42-45
New Monel clippings 28-29
Clean Monel turnings 20-23
Old sheet Monel 25-26
Nickel silver clippings, mixed. 18
Nickel silver turnings, mixed. 15

Lead

Soft scrap lead ..... 8½— 9
Battery plates (dry) ..... 3½— 3¾
Batteries, acid free ..... 2½— 2¾

Miscellaneous

Block tin ..... 75 —76
No. 1 pewter ..... 59 —60
Auto babbitt ..... 39 —40
Mixed common babbitt ..... 11 —11½
Solder joints ..... 14½—15
Siphon tops 42
Small foundry type ..... 12 —12¼
Monotype ..... 12 —12¼
Lino. and stereotype ..... 11 —11¼
Electrotype ..... 10 —10¼
Hand picked type shells .... 7 — 7½
Lino. and stereo. dross ..... 3 — 3¼
Electro dross ..... 2½— 2¾

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$114.00 *B3*		5.325 *B3*	7.00 *B3*	5.325 *B3*						
	Buffalo, N. Y.	$77.50 *R3, B3*	$96.00 *R3, B3*	$114.00 *R3, B3*	6.225 *B3*	5.325 *B3*	7.00 *B3*	5.325 *B3*	4.925 *R3, B1*	7.15 *S10*	7.325 *B3*			
	Phila., Pa.									7.70 *P15*				
	Harrison, N. J.													15.05 *C11*
	Conshohocken, Pa.		$101.00 *A2*	$121.00 *A2*					4.975 *A2*	7.20 *A2*	7.325 *A2*			
	New Bedford, Mass.									7.60 *R6*				
	Johnstown, Pa.	$77.50 *B3*	$96.00 *B3*	$114.00 *B3*		5.325 *B3*	7.00 *B3*							
	Boston, Mass.									7.70 *T8*				15.40 *T8*
	New Haven, Conn.									7.60 *D1*				
	Baltimore, Md.									7.15 *T8*				
	Phoenixville, Pa.					5.325 *P2*		5.325 *P2*						
	Sparrows Pt., Md.								4.925 *B3*		7.325 *B3*			
	Bridgeport, Wallingford, Conn.			$114.00 *N8*						7.60 *W1*				
	Pawtucket, R. I. Worcester, Mass.									7.70 *N7* 7.70 *A5*				15.40 *N7* 15.20 *T8*
MIDDLE WEST	Alton, Ill.								5.125 *L1*					
	Ashland, Ky.								4.925 *A7*					
	Canton-Massillon, Dover, Ohio		$96.00 *R3*	$114.00 *R3, T5*						7.15 *G4*		10.45 *G4*		14.85 *C11*
	Chicago, Ill. Franklin Park, Ill. Evanston, Ill.	$77.50 *U1, R3*	$96.00 *U1, R3,W8*	$114.00 *U1, R3,W8*	6.225 *U1*	5.275 *U1, W8,P13*	7.75 *U1,Y1* *W8*	5.275 *U1*	4.925 *W8, N4,A1*	7.25 *A1,T8* *M8*			8.10 *W8, S9,I3*	15.05 *A1, S9,G4*
	Cleveland, Ohio									7.15 *A5,J3*		10.45 *A5*	8.10 *J3*	
	Detroit, Mich.			$114.00 *R5*					5.025 *G3, M2*	7.25 *M2,D1, D2,G3,P11*	7.425 *G3*	~~10.60~~ *D2* 10.55 *G3*	8.10 *G3*	
	Anderson, Ind.									7.15 *G4*				
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$77.50 *U1*	$96.00 *U1*	$114.00 *U1, Y1*		5.275 *U1, I3*	7.75 *U1, I3*	5.275 *I3*	4.925 *U1, I3,Y1*	7.15 *Y1*	7.325 *U1, I3,Y1*	10.60 *Y1*	8.10 *U1, Y1*	
	Sterling, Ill.	$77.50 *N4*				5.275 *N4*			5.025 *N4*					
	Indianapolis, Ind.									7.30 *J3*				15.20 *J3*
	Newport, Ky.												8.10 *A9*	
	Middletown, Ohio													
	Niles, Warren, Ohio Sharon, Pa.		$96.00 *S1, C10*	$114.00 *C10,S1*					4.925 *R3, S1*	7.15 *R3,T4* *S1*	7.325 *R3, S1*	10.50 *S1* 10.45 *R3*	8.10 *S1*	15.05 *S1*
	Owensboro, Ky.	$77.50 *G5*	$96.00 *G5*	$114.00 *G5*										
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Aliquippa, Pa.	$77.50 *U1, P6*	$96.00 *U1, C11,P6*	$114.00 *U1, C11,B7*	6.225 *U1*	5.275 *U1, J3*	7.75 *U1, J3*	5.275 *U1*	4.925 *P6*	7.15 *J3,B4, S7*			8.10 *S9*	15.05 *S9*
	Weirton, Wheeling, Follansbee, W. Va.				6.225 *W3*	5.275 *W3*		5.275 *W3*	4.925 *W3*	7.15 *W3,F3*	7.325 *W3*	10.50 *W3*		
	Youngstown, Ohio	$77.50 *R3*	$96.00 *Y1, C10*	$114.00 *Y1*			7.75 *Y1*			7.15 *Y1,J3*	7.325 *U1, Y1*	10.65 *Y1*	8.10 *U1, Y1*	15.05 *J3* 10.65 *Y1*
WEST	Fontana, Cal.	$88.00 *K1*	$105.50 *K1*	$135.00 *K1*		6.075 *K1*	8.55 *K1*	6.225 *K1*	5.675 *K1*	~~9.00~~ *K1*				
	Geneva Utah		$96.00 *C7*			5.275 *C7*	7.75 *C7*							
	Kansas City, Mo.					5.375 *S2*	7.85 *S2*						8.35 *S2*	
	Los Angeles, Torrance, Cal.		$105.50 *B2*	$134.00 *B2*		5.975 *C7, B2*	8.45 *B2*		5.675 *C7, B2*	9.05 *J3* 9.20 *C1*			9.30 *B2*	17.25 *J3*
	Minnequa, Colo.					5.575 *C6*			6.825 *C6*	9.10 *K1*				
	Portland, Ore.					6.025 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$105.50 *B2*			5.925 *B2*	8.40 *B2*		5.675 *C7, B2*					
	Seattle, Wash.		$109.50 *B2*			6.025 *B2*	8.50 *B2*		5.925 *B2*					
SOUTH	Atlanta, Ga.					5.475 *A8*			4.925 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$77.50 *T2*	$96.00 *T2*			5.275 *T2, R3,C16*	7.75 *T2*		4.925 *T2, R3,C16*		7.325 *T2*			
	Houston, Lone Star, Texas		$101.00 *S2*	$119.00 *S2*		5.375 *S2*	7.85 *S2*						8.35 *S2*	

(Effective March 31, 1958)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* *1.25*-lb. base box	Electro* *0.25*-lb. base box	Holloware Enameling *29* ga.
EAST	Bethlehem, Pa.												
	Buffalo, N. Y.	4.925 *B3*	6.05 *B3*				7.275 *B3*	8.975 *B3*		6.15 *W6*			
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	4.975 *A2*	6.10 *A2*				7.325 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.15 *B3*			
	Fairless, Pa.	4.975 *U1*	6.10 *U1*				7.325 *U1*	9.025 *U1*			$10.15 *U1*	$8.85 *U1*	
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	4.925 *B3*	6.05 *B3*	6.60 *B3*			7.275 *B3*	8.975 *B3*	9.725 *B3*	6.25 *B3*	$10.15 *B3*	$8.85 *B3*	
	Worcester, Mass.									6.45 *A5*			
	Trenton, N. J.												
MIDDLE WEST	Alton, Ill.									6.35 *L1*			
	Ashland, Ky	4.925 *A7*		6.60 *A7*	6.625 *A7*								
	Canton-Massillon, Dover, Ohio			6.60 *R3, R1*									
	Chicago, Joliet, Ill.	4.925 *W8, A1*					7.275 *U1*			6.15 *A5, R3, W8, N4, K2*			
	Sterling, Ill.									6.25 *N4, K2*			
	Cleveland, Ohio	4.925 *R3, J3*	6.05 *R3, J3*		6.625 *R3*		7.275 *R3, J3*	8.975 *R3, J3*		6.15 *A5*			
	Detroit, Mich.	5.025 *G3, M2*	6.15 *G3* 6.05 *M2*				7.375 *G3*	9.075 *G3*					
	Newport, Ky	4.925 *A1*	6.05 *A1*										
	Gary, Ind. Harbor, Indiana	4.925 *U1, I3, Y1*	6.05 *U1, I3, Y1*	6.60 *U1, I3*	6.625 *U1, I3, Y1*	7.00 *U1*	7.275 *U1, Y1, I3*	8.975 *U1, Y1*		6.15 *Y1*	$10.05 *U1, Y1*	$8.75 *I3, U1, Y1*	7.50 *U1, Y1*
	Granite City, Ill.	5.125 *G2*	6.25 *G2*	6.80 *G2*	6.825 *G2*							$8.85 *G2*	7.60 *G2*
	Kokomo, Ind.			6.70 *C9*						6.25 *C9*			
	Mansfield, Ohio		6.05 *E2*			7.00 *E2*							
	Middletown, Ohio		6.05 *A7*	6.60 *A7*	6.625 *A7*	7.00 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	4.925 *R3, N3, S1*	6.05 *R3*	6.60 *R3*	6.625 *N3, S1*	7.00 *N3, S1, R3*	7.275 *R3*	8.975 *S1, R3*				$8.75 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Donora, Pa. Aliquippa, Pa.	4.925 *U1, J3, P6*	6.05 *U1, J3, P6*	6.60 *U1, J3*	6.625 *U1*		7.275 *U1, J3*	8.975 *U1, J3*	9.725 *U1*	6.15 *A5, J3, P6*	$10.05 *U1, J3*	$8.75 *U1, J3*	7.50 *U1, J3*
	Portsmouth, Ohio	4.925 *P7*	6.05 *P7*							6.15 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.925 *W3, W5*	6.05 *W3, F3, W5*	6.60 *W3, W5*		7.00 *W3, W5*	7.275 *W3*	8.975 *W3*			$10.05 *W5, W3*	$8.75 *W5, W3*	7.50 *W5*
	Youngstown, Ohio	4.925 *U1, Y1*	6.05 *Y1*		6.625 *Y1*		7.275 *Y1*	8.975 *Y1*		6.15 *Y1*			
WEST	Fontana Cal.	5.675 *K1*	7.30 *K1*				8.025 *K1*	10.275 *K1*			$10.80 *K1*	$9.50 *K1*	
	Geneva, Utah	5.025 *C7*											
	Kansas City, Mo.									6.40 *S2*			
	Los Angeles, Torrance, Cal.									6.95 *B2*			
	Minnequa, Colo.									6.40 *C6*			
	San Francisco, Niles, Pittsburgh, Cal.	5.625 *C7*	7.00 *C7*	7.35 *C7*						6.95 *C7*	$10.80 *C7*	$9.50 *C7*	
	Seattle, Wash.												
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	4.925 *T2, R3*	6.05 *T2, R3*	6.60 *T2, R3*	6.625 *T2*					6.15 *T2, R3*	$10.15 *T2*	$8.85 *T2*	
	Houston, Tex.									6.40 *S2*			

† Special coated mfg. terne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box.

* COKES: 1.50-lb. add 25¢.

ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.

(Effective March 31, 1958)

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfrs'. Bright
EAST	Bethlehem, Pa.				6.475 *B3*	8.775 *B3*	7.925 *B3*					
	Buffalo, N. Y.	5.425 *R3,B3*	5.425 *R3,B3*	7.35 *B5*	6.475 *B3,R3*	8.775 *B3,B5*	7.925 *B3*	5.10 *B3*		7.20 *B3*		7.65 *W6*
	Claymont, Del.							5.10 *C4*		7.20 *C4*	7.625 *C4*	
	Coatesville, Pa.							5.10 *L4*		7.20 *L4*	7.925 *L4*	
	Conshohocken, Pa.							5.20 *A2*	6.175 *A2*	7.20 *A2*	7.625 *A2*	
	Harrisburg, Pa.							5.10 *P2*	6.275 *P2*			
	Milton, Pa.	5.575 *M7*	5.575 *M7*									
	Hartford, Conn.			7.80 *R3*		9.075 *R3*	7.925 *B3*					
	Johnstown, Pa.	5.425 *B3*	5.425 *B3*		6.475 *B3*			5.10 *B3*		7.20 *B3*	7.625 *B3*	7.65 *B3*
	Fairless, Pa.	5.575 *U1*	5.575 *U1*		6.625 *U1*							
	Newark, N. J. Camden, N. J.			7.75 *W10* 7.75 *P10*		8.95 *W10* 8.95 *P10*						
	Bridgeport, Conn. Putnam, Conn. Willimantic, Conn.			7.85 *W10* 7.80 *J3*	6.55 *N8*	8.925 *N8*						
	Sparrows Pt., Md.		5.425 *B3*					5.10 *B3*		7.20 *B3*	7.625 *B3*	7.75 *B3*
	Palmer, Worcester, Readville, Mass. Mansfield, Mass.			7.85 *B5,C14*		9.075 *A5,B5*						7.95 *A5, W6*
	Spring City, Pa.			7.75 *K4*		8.95 *K4*						
MIDDLE WEST	Alton, Ill.	5.625 *L1*										7.85 *L1*
	Ashland,Newport,Ky.							5.10 *A7,A1*		7.20 *A1*		
	Canton, Massillon, Ohio			7.30 *R3,R2*	6.475 *R3,T5*	8.775 *R3,R2, T5*						
	Chicago, Joliet, Waukegan, Ill. Harvey, Ill.	5.425 *U1,R3, W8,N4,P13*	5.425 *U1,R3, N4,P13*	7.30 *A5, W10,W8 B5,L2,N9*	6.475 *U1,R3, W8*	8.775 *A5, W10,W8 L2,N8,B5*	7.925 *U1,W8*	5.10 *U1,A1, W8,13*	6.175 *U1*	7.20 *U1,W8*	7.625 *U1,W8*	7.65 *A5,R3, W8,N4, K2,W7*
	Cleveland, Ohio Elyria, Ohio	5.425 *R3*	5.425 *R3*	7.30 *A5,C13 C18*		8.775 *A5, C13, C18*	7.925 *R3*	5.20 *R3,J3*	6.175 *J3*		7.625 *R3, J3*	7.65 *A5, C13*
	Detroit, Mich.	5.525 *G3*	5.775 *G3*	7.55 *P3* 7.50 *P8,B5*	6.475 *R5* 6.575 *G3*	8.775 *R5* 8.975 *B5,P3, P8*	8.025 *G3*	5.20 *G3*		7.35 *G3*		
	Duluth, Minn.											7.65 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.425 *U1,I3, Y1*	5.425 *U1,I3, Y1*	7.30 *R3,J3*	6.475 *U1,I3, Y1*	8.775 *R3,M4*	7.925 *U1, Y1*	5.10 *U1,I3, Y1*	6.175 *J3,I3*	7.20 *U1,Y1*	7.625 *U1, Y1,I3*	7.75 *M4*
	Granite City, Ill.							5.30 *G2*				
	Kokomo, Ind		5.525 *C9*									7.75 *C9*
	Sterling, Ill.	5.525 *N4*	5.525 *N4*					5.10 *N4*				7.75 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.30 *C10*	6.475 *C10,S1*	8.775 *C10*	7.925 *S1*	5.10 *R3,S1*		7.20 *S1*	7.625 *R3, S1*	
	Owensboro, Ky.	5.425 *G5*			6.475 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.425 *U1,J3*	5.425 *U1,J3*	7.30 *A5,B4, R3,J3,C11, W10,S9,C8*	6.475 *U1,J3, C11,B7*	8.775 *A5, W10,R3,S9, C11,C8*	7.925 *U1,J3*	5.10 *U1,J3*	6.175 *U1*	7.20 *U1,J3, B7*	7.625 *U1,J3, B7*	7.65 *A5, J3,P6*
	Portsmouth, Ohio											7.65 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.10 *W5*				
	Youngstown, Ohio	5.425 *U1,R3, Y1*	5.425 *U1,R3, Y1*	7.30 *A5,Y1, F2*	6.475 *U1,Y1*	8.775 *Y1,F2*	7.925 *U1,Y1*	5.10 *U1,R3, Y1*		7.20 *Y1*	7.625 *U1, R3,Y1*	7.65 *Y1*
WEST	Emeryville, Cal. Fontana, Cal.	6.175 *J5* 6.125 *K1*	6.175 *J5* 6.125 *K1*		7.525 *K1*		8.625 *K1*	5.90 *K1*		8.00 *K1*	8.425 *K1*	
	Geneva, Utah							5.10 *C7*			7.625 *C7*	
	Kansas City, Mo.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*					7.90 *S2*
	Los Angeles, Torrance, Cal.	6.125 *C7,B2*	6.125 *C7,B2*	8.75 *R3,P14*	7.525 *B2*	10.75 *P14*	8.625 *B2*					8.60 *B2*
	Minnequa, Colo.	5.875 *C6*	5.875 *C6*					5.95 *C6*				7.90 *C6*
	Portland, Ore.	6.175 *O2*	6.175 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.125 *C7* 6.175 *B2*	6.125 *C7* 6.175 *B2*				8.675 *B2*					8.60 *C7 C6*
	Seattle Wash.	6.175 *B2,N6*	6.175 *B2*				8.675 *B2*	6.00 *B2*		8.10 *B2*	8.525 *B2*	
SOUTH	Atlanta, Ga.	5.625 *A8*	5.625 *A8*									7.65 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	5.425 *T2,R3, C16*	5.425 *T2,R3, C16*	7.90 *C16*			7.925 *T2*	5.10 *T2,R3*			7.625 *T2*	7.65 *T2,R3*
	Houston, Ft. Worth, Lone Star, Tex.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*	5.20 *S2* 5.20 *L3*		7.30 *S2*	7.725 *S2*	7.90 *S2*

† Merchant Quality—Special Quality 35¢ higher

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

D1 Detroit Steel Corp., Detroit
D2 Dearborn Div., Sharon Steel Corp.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owenboro, Ky.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 J. & L. Steel Co., Stainless Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ in.		¾ in.		1 in.		1¼ in.		1½ in.		2 in.		2½-3 in.		2 in.		2½ in.		3 in.		3½-4 in.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Youngstown *R3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Fontana *K1*	+8.25	+23.5	+5.25	+19.5	+1.75	+15.00	0.75	+14.25	1.25	+13.25	1.75	+12.75	3.25	+13.00								
Pittsburgh *J3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Alton, Ill. *L1*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Sharon *M3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Fairless *N2*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Pittsburgh *N1*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Wheeling *W5*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Wheatland *W4*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Youngstown *Y1*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Indiana Harbor *Y1*	4.25	+11.0	7.25	+7.0	10.75	+2.50	13.25	+1.75	13.25	+0.75	14.25	+0.25	15.75	+1.00								
Lorain *N2*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Youngstown *R3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Fairless *N2*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Fontana *K1*	+3.75		0.25		3.25		3.75		4.25		4.75		5.25									
Pittsburgh *J3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Alton, Ill. *L1*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Sharon *M3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Pittsburgh *N1*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Wheeling *W5*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Wheatland *W4*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Youngstown *Y1*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Indiana Harbor *Y1*	8.75	+5.0	12.75	+1.0	15.75	3.50	16.25	2.25	16.75	3.25	17.25	3.75	17.75	2.50								
Lorain *N2*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50

Threads only, buttweld and seamless 2½ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.

Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ⅜, ½ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 10¢ per lb.

(Effective March 31, 1958)

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Pct. Discounts

Machine and Carriage Bolts	Full Container Price	30 Containers	20,000 Lb.	40,000 Lb.
¼" and smaller x 6" and shorter	49	54	56	57
5/16" thru 1" x longer than 6"	35	40	43	45
Rolled thread carriage bolts ½" & smaller x 6" and shorter	49	54	56	57
Lag, all diam. x 6" & shorter	49	54	56	57
Lag, all diam. longer than 6 in.	39	44½	47	48½
Plow bolts, ½" and smaller x 6" and shorter	49	54	56	57

(Add 25 pct for broken case quantities)

Nuts, Hex, HP reg. & hvy.	Full case or Keg price
¾ in. or smaller	60½
⅞ in. to 1 in. inclusive	55½
1⅛ in. to 1½ in. inclusive	58½
1⅝ in. and larger	53½
C. P. Hex, reg. & hvy.	
¾ in. and smaller	60½
⅞ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½
Hot Galv. Hex Nuts (All Types)	
¾ in. and smaller	46½
Semi-finished Hex Nuts	
⅝ in. or smaller	60½
¾ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½
(Add 25 pct for broken case or keg quantities)	
Finished	
⅞ in. and smaller	63

Rivets

	Base per 100 lb
½ in. and larger	$12.25
	Pct. Off List
7/16 in. and smaller	19

Cap Screws

	Discount (Packages)	
	Full Finished H. C. Heat Treat	
New std. hex head, packaged		
⅝" diam. and smaller x 6" and shorter	40	26
¾", ⅞", and 1" diam. x 6" and shorter	22	3
⅝" diam. and smaller x longer than 6"	8	+13
¾", ⅞", and 1" diam. x longer than 6"	+ 6	+32
	C-1018 Steel Full-Finished Cartons	Bulk
¼" through ⅝" dia. x 6" and shorter	58	49
¾" through 1" dia. x 6" and shorter	45	33

Minimum quantity—¼" through ⅝" diam., 15,000 pieces; 1/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

Plain Finish	Discount Mach. Screws	Stove Bolts
Cartons	60	60
Bulk — *Quantity*		
To ¼" diam. incl. — 25,000-and over	60	..
5/16 to ½" diam. incl. — 15,000-200,000	60	..

Machine Screws & Stove Bolt Nuts

	Discount Hex	Square
In Cartons	16	19
Quantity		
In Bulk		
⅝" diam. & smaller — 25,000 and over	14	16

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.7
Chicago	140.9
San Francisco-L. A.	148.6

Dec. 1955. value, Class B or heavier 6 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Rolled elliptical, 18 in. or longer, 5000 lb lots	40.00
Electrodeposited	31.25
Brass, 80-20, ball anodes, 2000 lb or more	44.00
Zinc, ball anodes, 2000 lb lots	16.50
(for elliptical add 1¢ per lb)	
Nickel, 99 pct plus, rolled carbon, 5000 lb	1.0225
(Rolled depolarized add 3¢ per lb)	
Cadmium	1.55
Tin, ball anodes $1.13 per lb (approx.).	

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	68.70
Copper sulphate, 100 lb bags, per cwt.	22.15
Nickel salts, single, 100 lb bags	40.50
Nickel chloride, freight allowed, 300 lb	48.50
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	24.05
(Philadelphia price 24.50)	
Zinc cyanide, 100 lb	60.75
Potassium cyanide, 100 lb drum N. Y.	48.00
Chromic acid, flake type, 10,000 lb or more	31.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots for minus 100 mesh

Swedish sponge iron, del. East of Miss. River, ocean bags, 23,000 lb. and over	10.5¢
F.O.B. Riverton or Camden, New Jersey, freight allowed west of Miss. River	9.5¢
Domestic sponge iron, 98+% Fe, 23,000 lb. and over del'd East of Miss. River	10.5¢
F.O.B. Riverton, New Jersey, West of Miss. River	9.5¢
Canadian sponge iron, del'd in East, carloads	10.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe	57.0¢
Electrolytic iron melting stock, 99.84% pure	27.0¢
Carbonyl iron size 3 to 20 micron, 98%, 99.8+% Fe	88.0¢ to $2.85
Aluminum, freight allowed	38.00¢
Brass, 10 ton lots	31.1¢ to 47.1¢
Copper, electrolytic	41.50¢
Copper, reduced	40.3¢ to 48.8¢
Cadmium, 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic, 99.85% min. Fe. 03 max. Del'd	$5.00
Lead	21.50¢ lb, f.o.b. plant
Manganese f.o.b. Extron, Pa.	46.0¢
Molybdenum, 99%	$3.60 to $3.95
Nickel, chemically precipitated	$1.05
Nickel, unannealed	$1.00
Nickel, annealed	$1.06
Nickel, spherical, unannealed ±80	$1.13
Silicon	43.50¢
Solder powder	13¢ plus met. value
Stainless steel, 302	$1.02
Stainless steel, 316	$1.30
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	$3.15 (nominal)
Zinc, 5000 lb & over	17.5¢ to 30.7¢

WAREHOUSES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery‡ Charge	Sheets: Hot-Rolled (18 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		8.59	9.87	10.13	8.64	8.97	9.05	9.01	10.68	.....	.....	.....	.....
Baltimore	$.10	8.38	8.98	9.78	8.86	8.76	9.29	9.16	11.44*	16.18	15.18	19.73	18.98
Birmingham	.15	8.18	9.45	10.15	8.23	8.56	8.64	8.60	10.57	.....	.....	.....	.....
Boston	.10	9.48	10.54	11.55	9.52	9.82	9.73	9.83	13.00	15.79	15.38	19.89	19.18
Buffalo	.15	8.40	9.15	11.22	8.65	9.05	9.05	8.95	11.05*	16.34	15.15	19.01	18.95
Chicago	.15	8.35	9.60	10.25	8.38	8.71	8.79	8.75	8.95	15.80	14.80	19.35	18.60
Cincinnati	.15	8.49	9.65	10.25	8.69	9.08	9.33	9.07	9.46	15.61	15.11	18.96	18.91
Cleveland	.15	8.33	9.60	10 35	8.48	8.94	9.16	8.84	10.95*	15.89	14.89	19.44	18.96
Denver	.20	9.70	11.30	12.49	9.80	9.70	9.80	9.98	10.65	.....	.....	.....	17.60
Detroit	.15	8.58	9.85	10.60	8.73	9.06	9.33	9.05	9.30	15.46	15.06	18.81	18.86
Houston		7.10	8.40	.....	7.25	7.70	7.25	7.20	11.10	16.20	.....	19.30	19.05
Kansas City	.20	9.02	10.27	10.82	9.05	9.38	9.46	9.42	9.87	20.02	15.47	20.02	19.27
Los Angeles	.10	8.60**	10.85	11.75	8.65	8.65	8.70	8.65	13.35*	17.05	16.10	21.05	20.35
Memphis	.15	8.55	9.80	.....	8.60	8.93	9.01	8.97	12.11*	.....	.....	.....	.....
Milwaukee	.15	8.48	9.73	10.38	8.51	8.84	9.00	8.88	9.18	15.43	14.93	18.78	18.73
New York	.10	8.97	10.23	10.66	9.41	9.53	9.45	9.67	12.86*	15.02	15.19	18.42	18.99
Norfolk	.20	8.20	.....	.....	8.90	8.65	9.20	8.90	10.70	.....	.....	.....	.....
Philadelphia	.10	8.10	9.00	9.97	8.79	8.87	8.60	8.75	11.61*	15.61	15.11	18.96	18.91
Pittsburgh	.15	8.33	9.60	10.60	8.48	8.71	8.79	8.75	10.95*	15.80	14.80	19.35	18.60
Portland		10.00[1]	11.75[2]	13.30[3]	11.95[4]	10.10[5]	11.10[6]	9.85[7]	14.50	18.50	16.10	20.75	20.25
San Francisco	.10	9.45	10.85	11.10	9.55	9.70	9.60	9.80	13.10	17.05	16.10	21.05	20.35
Seattle		9.95	11.15	12.00	10.00	9.70	9.80	10.80	14.05	16.55	16.35	20.65	20.15
Spokane	.15	10.10	11.30	12.15	10.15	9.85	9.95	10.25	14.20	.....	17.35	21.55	21.05
St. Louis	.15	8.69	9.94	10.61	8.74	9.08	9.25	9.12	9.56	15.66	15.16	19.01	18.96
St. Paul	.15	8.94	10.19	10.86	8.99	9.45	9.53	9.37	9.81	.....	15.26	.....	19.06

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. **All sizes except 18 and 16 gage.

†† 10¢ zinc. ‡ Deduct for country delivery. * C1018—1 in. rounds. (1) 10 ga. x 36" x 120"; (2) 20 ga. x 36" x 120"; (3) 26 ga. x 30" x 96"; (4) ½" x 1" in lots of 1000 to 9999; (5) sheared plate ¼" x 84" in lots of 1000 to 9999; (6) 3" x 5.70" in lots of 1000 to 9999; (7) M-1020—1-in. rounds in lots of 1000 to 9999.

(Effective March 31, 1958)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.795	T-1
18	4	1	—	5	2.50	T-4
18	4	2	—	—	1.96	T-2
1.5	4	1.5	8	—	1.155	M-1
6	4	3	6	—	1.545	M-3
6	4	2	5	—	1.30	M-2
High-carbon chromium					.925	D-3, D-5
Oil hardened manganese					.475	O-2
Special carbon					.36	W-1
Extra carbon					.36	W-1
Regular carbon					.305	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*A3, J2, L4, C4*) 10 pct	Plate 15 pct	Plate 20 pct	Sheet (*I2*) 20 pct
Stainless Type	302	.....	.....	.....	37.50
	304	37.95	42.25	46.70	40.00
	316	44.40	49.50	54.50	58.75
	321	40.05	44.60	49.30	47.25
	347	42.40	47.55	52.80	57.00
	405	29.85	33.35	36.85	.....
	410	29.55	33.10	36.70	.....
	430	29.80	33.55	37.25	.....

CR Strip (S9) Copper, 10 pct, 2 sides, 38.75; 1 side, 33.10.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	$.525	6.50	6.975	.....	.....	.....	.....
Cleveland *R3*	.....	.....	.....	.....	.....	.....	14.75
So. Chicago *R3*	.....	.....	.....	9.75	.....	.....	.....
Ensley *T2*	.525	6.50	.....	.....	.....	.....	.....
Fairfield *T2*	.....	6.50	.....	9.75	.....	6.60	.....
Gary *U1*	.525	.....	.....	.....	.....	6.60	.....
Huntington *C16*	.....	6.50	.....	.....	.....	.....	.....
Ind. Harbor *I3*	.525	.....	6.975	9.75	.....	6.60	.....
Ind. Harbor *Y1*	.....	.....	.....	9.75	.....	.....	.....
Johnstown *B3*	.....	6.50	.....	.....	.....	.....	.....
Joliet *U1*	.....	.....	6.975	.....	.....	.....	.....
Kansas City *S2*	.....	.....	.....	9.75	.....	.....	14.75
Lackawanna *B3*	.525	6.50	6.975	.....	.....	6.60	.....
Lebanon *B3*	.....	.....	6.975	.....	14.50	.....	14.75
Minnequa *C6*	.525	7.00	6.975	9.75	.....	6.60	14.75
Pittsburgh *P5*	.....	.....	.....	.....	.....	.....	14.75
Pittsburgh *J3*	.....	.....	.....	9.75	.....	.....	.....
Seattle *B2*	.....	.....	.....	10.25	.....	6.75	15.75
Steelton *B3*	.525	.....	6.975	.....	.....	6.60	.....
Struthers *Y1*	.....	.....	.....	9.75	.....	.....	.....
Torrance *C7*	.....	.....	.....	.....	.....	6.75	.....
Williamsport *S5*	.....	6.50	.....	.....	.....	.....	.....
Youngstown *R3*	.....	.....	.....	9.75	.....	.....	.....

COKE

Furnace, beehive (f.o.b.) Connellsville, Pa.	Net-Ton $15.00 to $15.75
Foundry, beehive (f.o.b.)	$17.50 to $19.00
Foundry oven coke	
Buffalo, del'd	$31.75
Detroit, f.o.b.	30.50
New England, del'd	31.55
Kearney, N. J., f.o.b.	29.75
Philadelphia, f.o.b.	29.50
Swedeland, Pa., f.o.b.	29.50
Painesville, Ohio, f.o.b.	30.50
Erie, Pa., f.o.b.	30.50
Cleveland, del'd	32.65
Cincinnati, del'd	31.84
St. Paul, f.o.b.	29.75
St. Louis, f.o.b.	31.50
Birmingham, f.o.b.	28.85
Milwaukee, f.o.b.	30.50
Neville, Is., Pa.	29.25

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1958 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Cold-Reduced (Coiled or Cut Length) Fully Processed
Field	.....	9.625	.....
Armature	11.10	10.85	11.35
Elect.	11.80	11.55	12.05
Special Motor	.....	12.10	.....
Motor	12.90	12.65	13.15
Dynamo	13.95	13.70	14.20
Trans. 72	15.00	14.75	15.25
Trans. 65	15.55		
		Grain Oriented	
Trans. 58	16.05	Trans. 66	20.20
Trans. 52	17.10	Trans. 80	19.20
		Trans. 73	19.70

Producing points: Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*A9*); Niles, O. (*N3*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (In.)	GRAPHITE Length (In.)	GRAPHITE Price	CARBON* Diam. (In.)	CARBON* Length (In.)	CARBON* Price
24	84	26.00	40	100,110	10.70
20	72	25.25	35	110	10.70
18	72	25.75	30	110	10.85
14	72	25.75	24	72 to 84	11.25
12	72	26.25	20	90	11.00
10	60	28.00	17	72	11.40
10	48	28.50	14	72	11.85
7	60	28.25	12	60	12.95
6	60	31.50	10	60	13.00
4	40	35.00	8	60	13.30
3	40	37.00			
2½	30	39.25			
2	24	60.75			

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$135.00
No. 1 Ohio	120.00
Sec. Quality, Pa., Md., Ky., Mo., Ill.	120.00
No. 2 Ohio	103.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $2.00)	21.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$150.00
Childs, Hays, Pa.	155.00
Chicago District	160.00
Western Utah	175.00
California	180.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	157.00-160.00
Silica cement, net ton, bulk, Latrobe	28.50
Silica cement, net ton, bulk, Chicago	25.50
Silica cement, net ton, bulk, Ensley, Ala.	26.50
Silica cement, net ton, bulk, Mt. Union	24.50
Silica cement, net ton, bulk, Utah and Calif.	37.00

Chrome Brick

Per net ton

Standard chemically bonded, Balt.	$105.00
Standard chemically bonded, Curtiner, Calif.	115.00
Burned, Balt.	99.00

Magnesite Brick

Standard Baltimore	$131.00
Chemically bonded, Baltimore	116.00

Grain Magnesite

St. ⅝ to ⅛-in. grains

Domestic, f.o.b. Baltimore in bulk.	$73.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	46.00
in sacks	52.00-54.00

Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in: Pa., W. Va., Ohio	$16.75
Midwest	17.00
Missouri Valley	15.00

(Effective March 31, 1958)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	173	187	...	212	193	8.65	9.20
Aliquippa *J3***	173	190	...		190	8.65	9.325
Atlanta *A8***	175	192	...	214	198	8.75	9.425
Bartonsville *K2***	175	192	178	214	198	8.75	9.425**
Buffalo *W6*	.....	.....	.....	.....	.....	8.65	8.95*
Chicago *N4***‡*	173	190	172	212	196	8.65	9.325
Cleveland *A6*	.....	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	8.65	.....
Crawf'dsv. *M4***	175	192	...	214	198	8.75	9.425
Donora, Pa. *A5*	173	187	...	212	193	8.65	9.20
Duluth *A5*	173	187	...	212	193	8.65	9.20
Fairfield, Ala. *T2*	173	187	...	212	193	8.65	9.20
Galveston *D4***	9.10‡	.....	.....	.....	.....	.....	.....
Houston *S2*	178	192	...	217	198	8.90	9.45
Jacksonville *M4*	184-1	197	...	219	203	9.00	9.675
Johnstown *B3***	173	190	172		196***	8.65	9.325***
Joliet, Ill. *A5*	173	187	...	212	193	8.65	9.20
Kokomo *C9**	175	189	...	214	195*	8.75	9.30*
L. Angeles *B2****	.....	.....	.....	.....	.....	9.60	10.275
Kansas City *S2**	178	192	...	217	198*	8.90	9.45*
Minnequa *C6*†*	178	192	177	217	198†	8.90	9.45†
Monessen *P6*	.....	.....	.....	.....	193	8.65	9.20
Palmer, Mass. *W6*	.....	.....	.....	.....	.....	8.95	9.50*
Pittsburg, Cal. *C7*	192	210	...	...	213	9.60	10.15
Rankin, Pa. *A5*	173	187	...	...	193	8.65	9.20
So. Chicago *R3*	173	187	...	...	193	8.65	9.20
S. San Fran. *C6*†	.....	.....	.....	236	.....	9.60	10.15†
Sparrows Pt. *B3***	175	.....	.....	214	198	8.75	9.425
Sterling, Ill. *N4****	175	192	172	214	198	8.75	9.425
Struthers, O. *Y1**	.....	.....	.....	.....	.....	8.65	9.30
Worcester *A5*	179	.....	.....	.....	.....	8.85	9.50
Williamsport *S5*	.....	.....	.....	.....	.....	.....	.....

* Zinc less than .10¢.
** 11-12¢ zinc.
*** .10¢ zinc.
† Plus zinc extras.
‡ Wholesalers only.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Baltimore, Md. *T8*	9.50	10.40	12.60	15.60	18.55
Bristol, Conn. *W12*	.....	10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70	.....	.....
Detroit *D1*	9.05	10.50	12.70	15.70	.....
Detroit *D2*	9.05	10.50	12.70	.....	.....
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60	.....	.....
Franklin Park, Ill. *T8*	9.05	10.25	12.45	15.45	18.40
Harrison, N. J. *C11*	.....	.....	12.80	16.10	19.30
Indianapolis *J3*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	.....
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	.....
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	.....
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Pittsburgh *S7*	8.95	10.40	12.60	15.60	18.55
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*	.....	10.70	12.90	16.10	19.30
Wallingford *W1*	9.40	10.70	12.90	15.90	18.55
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *J3*	8.95	10.40	12.60	15.60	18.55

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
National Tube	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
Pittsburgh Steel	2	13	36.34	42.56	.....
	2½	12	48.94	57.31	.....
	3	12	56.51	66.18	.....
	3½	11	65.97	77.25	.....
	4	10	87.61	102.59	.....

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	.....
Birmingham *R3*	62.00	62.50*	.....	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	.....
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	66.50	67.00	67.50	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R5*	66.00	66.50	66.50	67.00	.....
Du'uth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Everett *M6*	67.50	68.00	68.50	.....	.....
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Sharpsville *S5*	66.00	66.50	66.50	67.00	.....
So Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	.....
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	74.00
Youngstown *Y1*	.....	.....	66.50	67.00	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31-0.69 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4* (Globe Div.), $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $103.50; (15.51-16.00), $106.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add $1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.): $64.00. Add $1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

Base price cents per lb f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.00	23.75	23.25	25.25	—	27.00	39.75	32.25	37.00	—	16.75	—	17.00
Slabs, billets	27.00	27.00	28.00	31.50	32.00	33.25	49.50	40.00	46.50	—	21.50	—	21.75
Billets, forging	—	36.50	37.25	38.00	41.00	40.50	62.25	47.00	55.75	32.00	28.25	28.75	28.75
Bars, struct.	42.00	43.00	44.25	45.00	48.00	47.75	73.00	55.50	64.75	37.75	33.75	34.25	34.25
Plates	44.25	45.00	46.25	47.25	50.00	50.75	76.75	59.75	69.75	40.25	35.00	36.75	36.00
Sheets	48.50	49.25	51.25	52.00	—	55.00	80.75	65.50	79.25	48.25	40.25	—	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	—	55.00	80.75	65.50	79.25	48.25	40.25	—	40.75
Wire CF; Rod HR	40.00	40.75	42.00	42.75	45.50	45.25	69.25	52.50 52.75	61.50	35.75	32.00	32.50	32.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2*, *J2*, Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*.

Strip: Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., (.25¢ per lb higher), *W2*; W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton Massillon, O., *R3*; Harrison, N. J., *D3*; Youngstown, *J3*; Sharon, Pa., *S1*; Butler, Pa., *A7* Wallingford, Conn., *U3* (plus further conversion extras), *W1*; New Bedford, Mass. (.25¢ per lb higher), *R6*; Gary, *U1* (.25¢ per lb higher).

Bar: Baltimore, *A7*; S. Duquesne, Pa., *U1*, Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1*, *F1* Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R5*, S. Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*, *R3*; Ft. Wayne, *I4*; Detroit, *R5*; Gary, *U1*; Owenboro, Ky., *G5*; Bridgeport, Conn., *N8*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.
Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*; S. Chicago, *U1*.

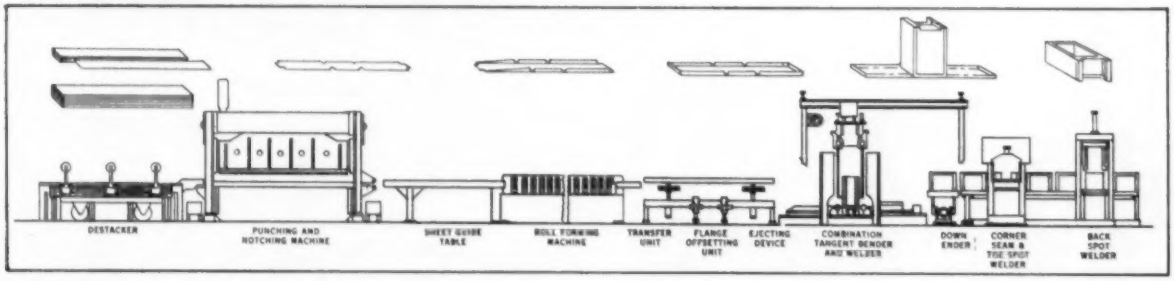
Plates: Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa. *C11*; New Castle, Ind., *I2*; Middletown; *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Vandergrift, Pa., *U1*; Gary, *U1*.

Forging billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R5*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*; Detroit, *R5*; Munhall, Pa., S. Chicago, *U1*; Owensboro, Ky., *G5*; Bridgeport, Conn., *N8*.

(Effective March 31, 1958)

EXPLORE

production economies possible by combining: assembly, metal forming and welding.



VISIT OUR BOOTH
100

AWS WELDING SHOW

COMPLETELY AUTOMATED METAL FORMING AND WELDING LINES

This is representative of the completely integrated lines now built by T-W, who also offers the largest selection of standard and specially designed resistance and arc welding machines. Taylor-Winfield's line now includes the metal-forming and work-handling equipment formerly built by Struthers-Wells. Call your nearby T-W representative for specialized help in improving your production rate and quality.

SALES and SERVICE
BALTIMORE
CHARLOTTE
CHATTANOOGA
CHICAGO
CLEVELAND
DALLAS
DAYTON
DENVER

The **TAYLOR·WINFIELD** *Corporation*
WARREN, OHIO
ELECTRIC RESISTANCE AND ARC WELDING MACHINES
METAL-FORMING AND WORK-HANDLING EQUIPMENT

SALES and SERVICE
DETROIT
LOS ANGELES
PHILADELPHIA
PORTLAND, OREGON
ROCHESTER
ST. LOUIS
STAMFORD
OAKVILLE AND
WINDSOR, ONTARIO

FERROALLOY PRICES

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.

0.02% C.... 41.00	0.50% C....	38.00
0.05% C.... 39.00	1.00% C....	37.75
0.10% C.... 38.50	1.50% C....	37.50
0.20% C.... 38.25	2.00% C....	37.25

4.00-4.50% C, 60-70% Cr, 1-2% Si.. 28.75
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 27.50
0.025% C (Simplex) 36.75
0.10% C, 52-57% Cr, 2.00% max Si. 37.50
7-8½% max C, 50-55% Cr, 3-6% max Si 22.50
7-8½% max C, 50-55% Cr, 3% max Si 25.00

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.31
0.50% max. C	1.31
9 to 11% C, 88-91% Cr, 0.75% Fe...	1.40

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads	$1.29
Ton lots	1.31
Less ton lots	1.33

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in. x down, packed.

Price is sum of contained Cr and contained Si.

	Cr	Si
Carloads	27.50	14.20
Ton lots	32.75	15.65
Less ton lots	34.35	17.30

Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads	25.65
Ton lots	27.95
Less ton lots	29.45

Calcium-Manganese—Silicon

Cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	24.25
Ton lots	26.15
Less ton lots	27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots	21.15
Less ton lots	22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5: 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots	18.45
Ton lots	19.95
Less ton lots	21.20

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	20.00
Ton lots to carload packed	21.15
Less ton lots	22.40

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	12.25
Johnstown, Pa.	12.25
Neville Island, Pa.	12.25
Sheridan, Pa.	12.25
Philo, Ohio	12.25
S. Duquesne	12.25

Add or substract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	14.80
Ton lots packed in bags	17.20

Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa., and Neville Island, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$100.50
19 to 21%	3% max.	102.50
21 to 23%	3% max.	105.00

Manganese Metal

2 in. x down, cents per pound of metal delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads	34.00
Ton lots	36.00
250 to 1999 lb	38.00
Premium for Hydrogen - removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn 25.50

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton (Bulk)	Less
0.07% max. C, 0.06% P, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	33.60	36.40	37.60
0.30% max. C	32.10	34.90	36.10
0.50% max. C	31.60	34.40	35.60
0.75% max. C, 80.85% Mn, 5.0-7.0% Si ...	28.60	31.40	32.60

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carloads bulk	12.80
Ton lots, packed	14.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet	15.10
Ton lots, packed, pallets	16.50

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots, packed	Carloads, packed
96.75% Si, 1.25% Fe..	24.20	22.90
98% Si, 0.75% Fe	24.95	23.65

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk	7.70
Ton lots, packed	10.50

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si....	14.20	75% Si....	16.40
65% Si....	15.25	85% Si....	18.10
		90% Si....	19.50

Ferrovanadium

50-55% V delivered, per pound, contained V, carloads, packed.

Openhearth	3.20
Crucible	3.30
High speed steel (Primos)	3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
1000 to 9999 lb.	2.40	3.30	4.55

(Effective March 31, 1958)

Alsifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads	10.60¢
Ton lots	11.95¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.28

Ferrocolumbium, 50-50%, 2 in. x D, delivered per pound contained Cb.

Ton lots	$4.25
Less ton lots.....	4.30

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Sb plus Ta $3.70

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.68

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton $90.00
10 tons to less carload $110.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots $1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $240.00

Ferrotungsten, ⅛ x down packed, per pounds contained W, ton lots delivered .. .. $2.15 (nominal)

Molybdic oxide, briquets per lb contained Mo, f.o.b. Langeloth, Pa. $1.41
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.38

Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.

Carload, bulk lump	18.50¢
Ton lots, packed lump	20.50¢
Less ton lots	21.00¢

Vanadium oxide, 86-89% V_2O_5 per pound contained V_2O_5 ..... $1.38

Zirconium, per lb of alloy

35-40% f.o.b. freight allowed, carloads, packed	27.25¢
12-15%, del'd lump, bulk-carloads	9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B
2000 lb carload $5.50

Bortram, f.o.b. Niagara Falls.

Ton lots per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.
Ton lots per pound ..... 14.00¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots.. $1.20
F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up

10 to 14% B	.85
14 to 19%	1.20
19% min. B	1.50

Grainal, f.o.b. Cambridge, O., freight, allowed, 100 lb and over

No. 1	$1.05
No. 79	50¢

Manganese-Boron, 75.00% Mn, 15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots (packed)	$1.46
Less ton lots (packed)	1.57

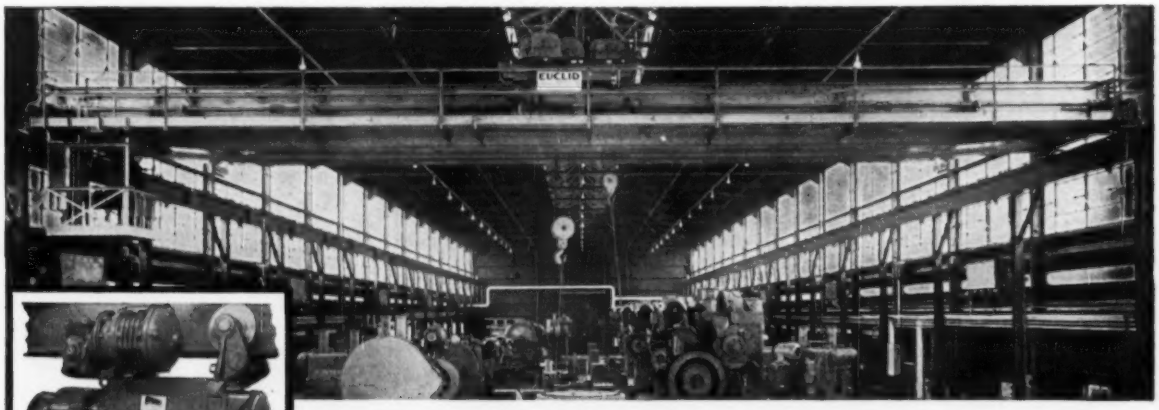
Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots 2.15

that "NEEDED LIFT" can come from EUCLID CRANES & HOISTS

You name the job or jobs to be done! We'll supply a crane or cranes that will do it. Standard Models in a wide range of styles, sizes and capacities will generally meet your requirements. If not, we'll engineer and build what you need. We've been doing it for more than 40 years.

TO "RAISE PROFITS"

GET A EUCLID PROPOSAL



In Capacities from 2000 to 50,000 lbs.

EUCLID SERIES H HOISTS

EUCLID HOISTS are highly efficient and strictly modern in every detail with oversize anti-friction bearings and heat treated steel parts in combination with a welded frame.

The planetary gearing and mechanical load brake are mounted in oil tight housings. The hoist gearing is assembled in the hoist drum.

This design produces an unusual compact, rugged and accessible hoist readily adapted to various installations and types of control.

for Details & Catalog, write

THE EUCLID CRANE & HOIST COMPANY
1361 CHARDON ROAD • CLEVELAND 17, OHIO

ELECTRIC FURNACE
STEEL CASTINGS
CARBON • ALLOY • STAINLESS

"C" Steel Castings possess many qualities other than the strength of steel. They provide for more freedom and efficiency of design, better weight-strength ratio and greater fatigue resistance, i.e., longer life and less replacement. "C" Steel Castings

SAND OR SHELL MOLDED

are foundry engineered from pattern to finished casting. They require minimum machining and assembly costs. Perhaps you can utilize the advantages of "C" Steel Castings in your products to reduce costs and gain additional quality and buyers' appeal. Our engineering staff is at your service. Write, phone or call.

CRUCIBLE STEEL CASTING CO.
LANSDOWNE 1, PENNA.

MACLEOD

BLAST CLEANING EQUIPMENT

•

NEW!
HIGH-SPEED
"Rapid-Blast"
MACLEOD
Blast Cleaning Cabinet

•

The Brand New Type AL "Rapid-Blast" Cabinet is specifically designed for high rate of continuous automatic production. Also a complete line of rooms, machines and dust arresters. Over 60 years experience designing and building special equipment. Write for descriptive literature on MACLEOD Blast Cleaning Rooms, Cabinets, and Machines.

Our 60th ANNIVERSARY YEAR

The MACLEOD Company
44 MOSTELLER RD., CINCINNATI 41, OHIO

RE-NU-BILT
GUARANTEED
ELECTRIC POWER EQUIPMENT
A.C. MOTORS
3 phase—60 cycle

SLIP RING

Qu.	H.P.	Make	Type	Volts	Speed
2	1750	G.E.	M-579BS	4800	1800
1	1500	G.E.	MT	6600	1187
1	1100	F.M.	OYZK, B.B.	4800	1800
1	800	G.E.	MT	2360	293
1	700	A.C.		2300	500
1	500	Whse.	CW	550	350
1	400	Whse.	CW	440	514
1	350	Cr.Wh.	Hise 71	208/416	1765
1	350	G.E.	IM-17A	440/2200	720
1	250	G.E.	MT-454Y	4000	257
1	250	Cr.Wh.	Hise 280	2300	350
1	250	Al.Ch.		550	600
1	200	G.E.	IE13 B-M	220/440	1760
1	200	Cr.Wh.	20QB	440	505
1	200	G.E.	IM	440	435
3	200	G.E.	I-17AM	2200	435
1	200	G.E.	IM	2200	580
1	150(unused)	Whse.	CW	2300	435
1	125	A.C.		440	885
1	125	Al.Ch.		440	720
1	100	G.E.	IM-10	2200	435
1	100	G.E.	IM	440	600
4	100	A.C.	ANY	440	695

SQUIRREL CAGE

1	800	G.E.	KT-578	2200	1180
1	650	G.E.	FT-559BY	440	3570
3	540	Whse.	CS-1216	2000	500
2	450	Whse.	CS-1429	2300/4150	354
1	400	G.E.	IK	2200	500
1	300	Elliott	SC-BB DP	440	1190
1	300	G.E.	KT 559A	2300	1775
1	200	G.E.	IK 17	440	580
2	200	G.E.	KT-557	440	1800
1	150/75	G.E.	IK	440	900/450
1	150	Whse.	CS856S	440	880
1	150	Whse.	CS	440	580

SYNCHRONOUS

Qu.	H.P.	Make	Type	Volts	RPM
1	7600	G.E.	ATI	2200/6600	600
1	4350	C.W.	3501SL4000/6900/13800		514
1	3500	G.E.	TS	4600/2300	360
1	2850	Whse.	Sp.f	2300/4600	514
1	2800	Whse.	Sp.f	2200	720
1	2000	Whse.		2300	102
2	1750	G.E.	ATI	2200	3600
1	735	G.E.	ATI	2300/12000	600
1	450	Whse.		2200	128.5
1	325	G.E.	ATI	440	1800
1	225	G.E.	ATI	440	1800
1	100	G.E.	TS-7556	220/440	900

BELYEA COMPANY, Inc.
47 Howell Street, Jersey City 6, N. J.

RAILWAY EQUIPMENT
FOR SALE
Used - As Is - Reconditioned
RAILWAY CARS
All Types
SERVICE-TESTED
FREIGHT CAR REPAIR PARTS
For All Types of Cars
LOCOMOTIVES
Diesel, Steam, Gasoline
Diesel-Electric

SPECIAL
STANDARD GAUGE CARS
COVERED HOPPER CARS
10—70 Ton Capacity
ORE HOPPER CARS
660 Cubic Feet
40- and 50-Ton Capacity
SIDE DUMP CARS
6-Air-operated, Austin-Western
30-Cubic Yard
3 Drop and 3 Lift Door Type

RAILWAY TANK CARS and STORAGE TANKS
6,000- 8,000- and 10,000-Gallon
Cleaned and Tested
CRANES
Overhead and Locomotive
IRON & STEEL PRODUCTS, Inc.
General Office
13496 S. Brainard Ave.
Chicago 33, Illinois
Phone: Mitchell 6-1212
New York Office
50-B Church Street
New York 7, N. Y.
Phone: BEekman 3-8230
"ANYTHING containing IRON or STEEL"

New York Writes Off Upturn Before Fall

Used machinery dealers in that area don't look forward to spring and summer with any real enthusiasm.

Only construction equipment is showing any activity in the present market.

▪ Despite reports of brightening business outlook for used and rebuilt machinery from other parts of the country, New York area dealers view the spring and summer with deep gloom.

Reports are almost unanimous that business in the area is very slow. Inquiries continue, but with little acceleration. And few are converted into sales. The picture is the same for both domestic and export markets.

Looking Toward Fall — Most dealers see little hope of a real upturn until fourth quarter. They point out that prospective customers have few orders of their own in hand now. While some new contracts should come through in spring and summer, any big pickup may not push through to machinery dealers until fall.

Only bright spot seems to be construction machinery. Demand for such items as shears, ironworkers, bending rolls, and press brakes has stayed relatively high throughout the winter. What's more, a seasonal pickup in spring is traditional.

But several dealers report that this spurt, if it comes, will still not be enough to put them in the black. They expect to operate at a loss until fourth quarter, doubt that they will wind up with profits at end of '58.

The Credit Block—Money is the root of many sales difficulties. Despite easier credit terms at local banks, many sales prospects are having difficulty financing machinery purchases. "It's the same old story," says one dealer, "if you have the money, the banks are glad to lend it to you." Actually, credit difficulties can usually be traced to thin order books and low accounts receivable by small and medium-sized metalworking shops in the area.

Supply Shortage? — "Under the circumstances, there's not much we can do but grin and bear it," comments a leading dealer.

One possible future problem may be shortage of tools. Late-model tools in good condition have never been plentiful in this area. Current low order rate of new machine tools could well mean even shorter supplies in the future.

Machine Replacement

Supplies of late-model used machinery may become more plentiful if bills introduced in the House and Senate are passed.

The bills are aimed to encourage replacement of worn-out or obsolete machine tools used in government defense plants and by private contractors. To accomplish this a machine-tool revolving fund would be set up. Its income would be derived from rentals paid the government by contractors for use of federally-owned equipment. Funds would be spent for new machine tools.

CONSIDER GOOD USED EQUIPMENT FIRST

BALER
Model #122-PX-60 Logemann, Baling Chamber 60 x 14 x 18"

BENDING ROLLS
8' x ¼" Bertsch Initial Type
10' x ½" King Pyramid Type
10' x 1½" Hilles & Jones Pyramid Type
12' x 5/16" Bertsch Initial Type
18' x 1" Niles Pyramid Type

BRAKE—LEAF TYPE
12' x ¼" Dreis & Krump No. 226

BRAKE—PRESS TYPE
10' x ⅛" & 12' x ¼" Hydraulic—NEW

CRANES—OVERHEAD ELECTRIC TRAVELING

3 ton	P&H	56' Span 220/3/60
5 ton	Shepard Niles	70' Span 230 Volt D.C.
8 ton	P&H	55' Span 220/3/60
10 ton	Shaw	48' Span 230 Volt D.C.
10 ton	P&H	53' Span 250 Volt D.C.
10 ton	Shaw	120' Span 230 Volt D.C.
15 ton	Shepard Niles	56' Span 230 Volt D.C.
20 ton	Shepard Niles	98' Span 230 Volt D.C.
20 ton	P&H	100' Span 250 Volt D.C.
120 ton	Shepard Niles	77' Span 220/3/60

CUT-OFF MACHINE
AC-2 Yoder, Motor Driven

DRAW BENCHES
8,000# Waterbury Farrel Single Draw 20 Ft. Length of Draw
10,000# Aetna Standard Single Draw 44 Ft. Length of Draw

FORGING MACHINES
1" to 5" Acme, Ajax, National

FURNACE—MELTING
15 ton Heroult Top Charge, 12' Shell

HAMMERS—BROAD DROP—STEAM DROP—STEAM FORGING 860 lb. to 12,000 lb. incl.

LEVELERS—ROLLER
37" Torrington, 19 Rolls 1 31/32", dia.
44" Newbold, 9 Rolls 4" dia.
60" Aetna Standard, 17 Rolls 4⅝" dia.

PLATE DUPLICATOR
No. 12 Thomas Single End, Punch Capacity 150 tons Table Area for handling 5' x 16' Plates

PRESSES—HYDRAULIC
500 ton Watson Stillman 4 Col. Piercing Press
600 ton HPM Fastraverse, Bed 36" x 36"
600 ton Elmes, 36" Stroke, 48 x 45" Bet. Cols.
1500 ton Bliss 15" Stroke, Bed 49" x 48"
1500 ton Mesta Steam Hydr. Forging Press
4500 Baldwin-Lima-Hamilton Hydr. Forging Press

PRESSES—STRAIGHT SIDE
180 ton Hamilton #847, 12" Str. 35½" Bet. Ups.
200 ton Clearing F1200-42, Stroke 20", Bed 44"x38"
250 ton Bliss SI 7½ Str. Histr. 32"x39"

PUNCH & SHEAR COMBINATIONS
Cleveland Style C, Arch Jaw, Capy. ¾" x ¾"
Cleveland Style EF, Arch Jaw, Capy. 1¼" x 1"
Cleveland Style G Single End, 60" Throat

RIVETER
80 ton Hanna Bull Riveter 24" Gap, 10'6" Reach, Capacity 1¼" Rivets

TORRINGTON FLAT WIRE MILL LINE
Two Stand Two High 6" x 5", Comp. with Acc.

ROLLING MILLS
6" x 1" Three Stand Wire. Rolling Mill Complete with Pay Off & Recoiler
8" x 10" Single Stand Two High
10" x 14" Single Stand Two High
16" x 16" Single Stand Two High
13" x 12" Single Stand Two High
12" x 16" Single Stand Two High
16" x 24" Single Stand Two High
20" x 36" Single Stand Two High

ROLLS—FORMING
6 Stand Yoder M-1½
14 Stand Yoder, 2½ Shaft, 30" Bet. Housings
18 Stand Custom Built, 2⅜" Shaft, will take 36" wide
14 Stand Custom Built, 1⅞" Shaft x 14 3/16"

ROLLS—PLATE STRAIGHTENING
108" Bertsch, Seven Rolls 9" Dia.
72" Niles, 7 Rolls 9" Dia. Motor Driven

SHEAR—ALLIGATOR
No. 4 Mesta RH LK, Capacity 2" x 12"

SHEAR LINES
36" x .020 Ga. Hallden Shear Line
42" Bliss Up-Cut Shear, Capacity .125" Max. With Hump & Run-out Tables

SHEARS—SQUARING
10' x ⅛" Bertsch
14' x 3/16" Cincinnati #1814

SHEAR—ANGLE
6 x 6 x ⅝" Hilles & Jones

SLITTER
36" Rafter, 4" Dia. Arbor—New 1953
36" Wean Slitting Line

STRAIGHTENERS
24" Hallden Straightening & Cutting Machine
No. 3 Medart 3 Roll, Capacity to 4½" Tubing
Torrington 12-Roll Capy. 1⅝" Sq. Etc.
No. 0 Medart 2 rolls, Capacity to 1¼" dia. Bars

SWAGING MACHINE
#6½A Fenn Capacity 3⅝" Tube, 1¼" Solid
10" Die Length Hydraulic Feed, LATE

WIRE DRAWING MACHINES
Type B Morgan 4-Block, Capy. #5 Rod down
No. 2 Vaughn 12-Die Continuous, Capy. #14 to #27

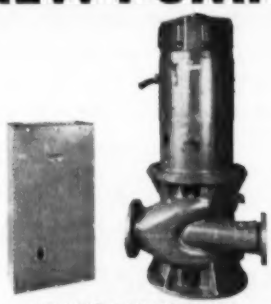
• Manufacturing **A. T. HENRY & COMPANY, INC.** Equipment •

50 CHURCH ST., NEW YORK CITY 8
Telephone COrtlandt 7-3437

Confidential Certified Appraisals
Liquidations — Bona Fide Auction Sales Arranged

Consulting Engineering Service
Surplus Mfg. Equipment Inventories Purchased

NEW PUMPS



NEW LST BALLAST PUMPS

Vertical—all bronze. Gardner-Denver pump; 8" suction, 6" discharge; 1500 GPM; 56' head. Powered by 30 HP type DN Century motors; 230 volts DC. Frame 375-S. Full magnetic Cutler-Hammer controller, Bulletin 6942. Drip-proof, with push-button control, overload and low voltage protection. In original crates. Excellent for aux. circulating, ballast, booster, etc.

NEW LSM VERTICAL BALLAST PUMPS

All bronze centrifugal pump; 1500 GPM @ 56' head; 30 HP—1750 RPM. Flanged inlet 8"; flanged outlet 6". Powered by Westinghouse 30 HP 440/3/60 1750 RPM motor, marine-type drip-proof, complete with magnetic controller. Use for ballast or circulating.

THE BOSTON METALS CO.
313 E. BALTIMORE STREET
BALTIMORE 2, MD. ELgin 7-5050

MILES FOR VALUES

New Stock Catalog Available

9⅝" Model 420 Barnes deep hole drill, 2 spindle
180 ton No. 27 Williams and White bulldozer
6" capacity No. 401 Campbell "Cutamatic" abrasive cut-off
2850 CFM Worthington 658 HP synchronous motor electric drive compressor
20" swing No. 217 Baker Brothers box column heavy duty upright drill
4' arm 9" column Cincinnati Bickford super service radial
24" Cincinnati 4 spindle upright drill, spindle motor drive
No. 15½ Foote Burt vertical hydraulic feed driver for a multiple head (2)
20" x 72" Landis type D heavy duty plain hydraulic cylindrical grinder
53" No. 24A Gardner vertical spindle horizontal disc grinder, 15 HP, multiple vee belt dr.
8" x 24" No. 3S Abrasive grinder
300 lb. No. 3C Chambersburg pneumatic forging hammer
2B Nazel forging hammer
4" bar Universal "Tri-Way" horizontal boring, milling and drilling machine
30" x 30" x 8' Cincinnati Hypro two rail, one right hand side head, dial feed planer
600 ton No. 664 Toledo tierod frame knuckle joint coining press
600 ton Elmes cast steel high speed downward acting hydraulic press
500 ton Baldwin Southwark high speed hydraulic vertical downward working press
800 ton Model 2E48-800 Hamilton straight side single crank air clutch press
750 ton No. 3 National all steel Maxipress
96" x ⅜" capacity Beatty No. 29 power squaring shear, late

Ask for latest stock list

MILES MACHINERY CO.
PHONE SAGINAW PL 2-3105
2041 E. GENESEE AVE. SAGINAW, MICH.

REBUILT — GUARANTEED ELECTRICAL EQUIPMENT

SYNCHRONOUS MOTORS
3-Phase—60 Cycle

Qu.	HP	Make	P.F.	Volts	R.P.M.
1	1750	G.E.	100	2200	3600
1	1500	G.E.	80	4150/2400	900
1	1500	Whse.	90	2300	514
2 (new)	1450	Whse.	80	4160	450
1	920	G.E.	80	2300/440	300
1	700	Ri. Mohy.	100	440	300
1	450	Whse.	100	2300	138
2	350	G.E.	100	2300	900
1	300	Whse.	80	2300	900
1	300	G.E.	100	2300/440	720
1	300	G.E.	800	2300/440	600
1	200	Al. Ch.	100	2200	514
1	200	Al. Ch.	100	2300/440	360

SLIP RING MOTORS
Constant Duty—3 Phase, 60 Cycle

Qu.	HP	Make	Type	Volts	R.P.M.
1	1800	Whse.	CW	2300	352
3	1500	G.E.	MT	6900/4160	444
1	600	G.E.	1M	2300	253
2	500	Al. Ch.	ARY	2300	585
1	500	G.E.	I-M	2300	450
1	400	Al. Ch.	ARY	2300	505
1	400	Whse.	CW	2300	290
1	350	G.E.	IE15B	2300	1180
1	350	G.E.	MT-412	2300	450
1	300	Whse.	CW-1012	2300	720
1	300	G.E.	I-M	440	1200
1	250	Al. Ch.	ARY	440	705
1	250	Whse.	CW	4160/2300	720
1	250	G.E.	I-M	550	450
1	250	G.E.	MT-414	2300	300

Westinghouse Net Work unit with network protector, 500-KVA, 3 phase, 60 cycle transformer 13,200/11,000-120/208-Volts with throat connected primary disconnect switch both inertsom filled with throat connected protector cubicle having following 3-pole air circuit breakers, all with (3) overloads —(1) 1900 amps. motor operated drawout breaker, (2) 600 amps. manual operated breakers, (8) 225 amps. manual breakers.

OUTDOOR OIL CIRCUIT BREAKERS
3-Pole—Electrically Operated

Qu.	Amps.	KV	Make	Type	Int. Cap.
1	400	72	Whse.	G-11	500-MVA
1	600	69	G.E.	FK-339	500-MVA
1	600	37	G.E.	FHKO-236	500-MVA
1	600	34.5	Al.Ch.	FZO-50-34X	250-MVA
1	400	37	G.E.	FHKO-136	250-MVA
1	400	15	G.E.	FHKO-136	300-MVA
1	600	14.4	G.E.	FLO-14.4-4	250-MVA

T. B. MAC CABE COMPANY
4302 Clarissa St., Philadelphia 40, Penna.
Cable Address "Macsteel" Philadelphia, Pa.
Phone Davenport 4-8300

RAILS—All Sections

NEW RELAYING—All Accessories

TRACK EQUIPMENT, FROGS—CROSSINGS—TIE PLATES, CONTRACTORS AND MINE & MINING MACHINERY CARS

M. K. FRANK
Grand Central Palace, New York
401 Park Bldg., Pittsburgh, Pa.
105 Lake Street, Reno, Nevada
1200 Metropolitan Bank Bldg., Miami, Fla.

½, 1½ Buffalo Forge Ironworkers.
3' x 11", 3' x 13" Cinc. Bickford Super Service Radial Drills.
6' x ⅛" Lown Pinch Bending Roll.
6' x 12 ga. Wysong & Miles Bending Roll.

FALK MACHINERY COMPANY
16 Ward St. Baker 5-5887 Rochester 5, N. Y.

1—AUTOMATIC COOLING BED FOR BARS up to 2" dia., consists of run-in table, cascade section, shuffle bar section, runout table, with all electrics, 200 ft. long.
1—28" x 40" HOT STRIP MILL, 2-high, reversing with 2500 HP D.C. motor, etc.
2—28" 3-HIGH ROLL STANDS with inlet, outlet and intermediate tables. Will produce 4" sq. billets from 8" sq. blooms in 6 passes, includes bloom shear.
1—28" REVERSING BREAKDOWN MILL.
1—25" x 42" x 60" HOT STRIP MILL, 4-high.
1—28" PINION STAND, 2-high, modern design.
1—16 x 22" COLD MILL 2-high.
1—12" x 12" COLD MILL, 50 HP motor.
1—10" x 10" 2-HIGH COLD MILL, Combination pinion stand and gear, extra forged steel rolls.
1—8" x 10" COLD MILL including uncoiler, recoiler and edging rolls.
1—10" ROD MILL.
1—9" BAR MILL, 3-high.
1—REEL, 11" face x 17½" dia.
1—UNCOILER, drag type, 60" maximum width, for cold mill.
1—RECOILER for 80" wide strip.
1—1500 TON STEAM HYDRAULIC FORGING PRESS.
1—34" x 192" ROLL GRINDER
2—90-ton Treadwell HOT METAL TRANSFER CARS.
2—65-ton ELECTRIC MELTING FURNACE, TOP CHARGE, with all electrical and mechanical equipment including 15,000 KVA and 13,333 KVA transformers.
1—ROLLER LEVELLER McKay, rolls 80" face & 5½" dia. with gear box and universal spindles.
1—STRETCHER LEVELER for sheets, 500,000 lb.
2—KANE & ROACH BAR AND ANGLE STRAIGHTENERS, Size #4, cap. 3" x 3" x ⅝" angles 3½" channels and 2" bars.
1—STRAIGHTENER, MEDART No. 0 for rounds 1¼ x 1½ dia.
1—STRAIGHTENER, MEDART No. 04A, for rounds ½" to 1" dia.
1—MORGAN FLYING SHEAR FOR BARS up to 1½" square, moving at speeds up to 1800 FPM.
2—UNITED HOT SAWS, 50", sliding frame.
1—UNITED #4 BAR SHEAR vertical open side.
1—156" x ½" SHEET SQUARING SHEAR.
1—SLITTING SHEAR FOR SHEET, Mesta 92".
1—HALLDEN FLYING SHEAR LINE, capacity 36" wide x 20 to 34 gauge x 15" to 144" long.
1—Tandem SLITTING AND CUT - TO - LENGTH LINE, heavy duty, max. opening for 38" wide.
1—MORGAN INGOT STRIPPER CRANE, 50' span, 200 tons capacity, 230 volts D.C.
1—44" ROLL LATHE, enclosed headstock, tailstock, plano rest, 20 HP 500/1500 RPM 230 volts, D.C. motor and controls.
3—Blaw-Knox SLAG LADLE TRANSFER CARS.
1—DRAWBENCH, Mesta, all-hydraulic, for 3 strands of bars 20' long.
1—WIRE DRAWING MACHINE, Aetna-Standard 16" block, 5-unit.
2—PICKLING MACHINES for sheets, Mesta.
2—50 - TON CAPACITY HOLDING FURNACES, electric, each with 7500 KVA transformer.
2—PACK FURNACES for hot sheet mills 62" x 60" double chamber.
2—MORGAN TRAVELING TILTING TABLES for 24" 3-high bar mill.
1—3000 HP GEAR DRIVE, ratio 500 to 73.7 RPM.
1—3000 HP GEAR DRIVE, ratio 500 to 95.8 RPM.
1—1200 HP GEAR DRIVE, 358 to 94.6 RPM, 3.78 to 1 ratio.
2—25 HP SPEED REDUCERS, Falk 21 to 1.
1—3000 HP MOTOR, 11000 volts, 3 phase, 60 cycle, 514 RPM.
1—1200 HP MOTOR, 2200 volts, 3 phase, 60 cycle, 333 RPM.
1—50 HP MOTOR, G.E. frame MD-810-AE, 230 volts, 500 RPM.

FRANK B. FOSTER, INC.
2220 Oliver Building, Pittsburgh 22, Pa.
Cable: "Foster, Pittsburgh" Telephone Atlantic 1-2780

SAVE up to 50% ON PLASTIC-COATED GLOVES!

$3.50 Dozen Pr. F. O. B. Detroit

● Unlimited supply . . . New plastic-coating (Ebony or Amber) on sterile, thoroughly reconditioned canvas gloves offered at a fraction of new glove cost. Available in Men or Women sizes, knit wrist or band top. Terms: Cash with order or C. O. D. Satisfaction guaranteed.

INDUSTRIAL SERVICES
P. O. BOX 3754 • DETROIT 37, MICH.

eastern Rebuilt Machine Tools

THE SIGN OF QUALITY—THE MARK OF DEPENDABILITY

No. 24—21" Bryant, m.d.
No. 24—L—36" Bryant, m.d., late
No. 24—LW—36" Bryant, m.d., late
No. 44 Heald Facing Type Boramatic, m.d.
No. 649—16" Van Norman Automatic Oscillating Radius, m.d., latest
No. 70A Heald, m.d., latest, 1945
No. 72A Heald Gagematic, m.d.
No. 72A3 Heald Full Universal, m.d.
No. 72A3 Heald Gagematic, m.d.
No. 72A3 Heald Sizematic, m.d.
No. 72A3 Heald Plain, m.d.
No. 72A5 Heald Plain, m.d.
No. 73 Heald Airplane, m.d., latest, new
No. 74 Heald Long Base, 1943
No. 74 Heald Extended Bridge Type, m.d.
No. 75A Heald, m.d., latest
No. 74 Heald, Plain Long Base, m.d., 1941
No. 81 Heald Gagematic, Sizematic, m.d.
No. 81 Heald Plain & Sizematic, m.d.
No. 104 Rivett, m.d.
No. 172 Heald Plain Adjustable Gap Hydraulic, m.d.
Model DB-102 Excello Double End Boring Machine, m.d.
Model 2TR Springfield Crown Type Vertical Universal, m.d.

We carry an average stock of 2,000 machines in our 11 acre plant at Cincinnati. Visitors welcome at all times.

THE EASTERN MACHINERY COMPANY
1002 Tennessee Avenue, Cincinnati 29, Ohio
MElrose 1241 "TWX" CI 174 CABLE ADDRESS—EMCO

UNIVERSAL Machinery & Equipment Co.

AMERICA'S LARGEST STOCK OF FOUNDRY EQUIPMENT

ARC MELTING FURNACES
1— 250# LECTROMELT—300 KVA
1— 500# LECTROMELT—300 KVA, 2300/3/60
1—2000# GREENE—800 KVA, 2300/3/60
1—3000# LECTROMELT—800 KVA, 2300 V.
1—3000# LECTROMELT—1200 KVA, 11,000 V.
1—3000# HEROULT—1200 KVA, 2300 V.
1—6000# LECTROMELT—1800 KVA, 4600 V.
1—6000# SWINDELL Top Charge—Late
DETROIT FURNACES—10# to 3000#

INDUCTION MELTING FURNACES
1— 3 KW AJAX, Lab Type
1— 20 KW AJAX Spark Gap, High Freq.
1— 50 KW AJAX 100# cap., MG Set
2—150 KW AJAX WYATT—60 cycle, Brass
1—333 KW AJAX 1000# Steel

. . . SPECIAL . . .
500,000 lb. Tinius Olsen COMPRESSION TESTING MACHINE
Hydraulic 24" Stroke 72" Specimen Length
LIKE NEW—Offered at a BARGAIN

HEAT TREAT FURNACES
1—2' x 3' x 6' deep, TATE JONES, gas fired, 1800°F.
1—20" x 24" deep, L&N Homocarb electric
1—20" x 36" L&N electric Hardening
1—6' x 6' x 15' LINDBERG Car Type electric, 1400°F.
1—50 KW WESTINGHOUSE Induction Heating Unit

CLEANING EQUIPMENT AND GRINDERS
1—36" Continuous WHEELABRATOR, used 2 mo's.
1—27 x 36 WHEELABRATOR w/loader
1—36 x 42 WHEELABRATOR w/loader
1—48 x 42 WHEELABRATOR w/loader
1—AMERICAN 48" Swing Table
1—PANGBORN 6' Table-Room, Type LK
1—PANGBORN TABLAST, 8' Table
10—5 to 15 H Hevi-Duty, Double End Grinders
LARGE STOCK OF DUST COLLECTORS

1630 NORTH NINTH ST. READING, PA. PHONE FRANKLIN 3-5103

PRESS, TRIMMING
(NEW - 1951)
200 TON CHAMBERSBURG
12" Stroke, Adj. Ram 31½" x 61¼" bed area
Side Shear, Tie-Rod Construction
Air Clutch, V-Belt Drive
Air Counterbalance, Single Geared
EXCELLENT CONDITION
LANG MACHINERY CO., INC.
28th St. & A.V.R.R. Pittsburgh 22, Pa.
GRant 1-3594

OFFERING
BRIDGE CRANES
ARNOLD HUGHES COMPANY
2765 Penobscot Bldg. Detroit, Mich.
WOodward 1-1894

AVAILABLE 3500 K.W. M.G. SETS SAVE $300,000

ALLIS-CHALMERS 3-Unit Sets Each Consisting of:

(2)—1750-KW Generators 250/350-Volt parallel, 500/700 Volts series, 5000 amps., 514 R.M.P., separately excited fields, direct connected to a common 5000-HP Synchronous motor, 13,800/6900/4000-Volt, 3 phase, 60 cycle. The above rated continuous 40° C, class B insulation with enclosing covers, motor driven fan, for forced ventilation. Each set includes a direct connected 10-KW and 40-KW exciter.

These are of very late design with rolled steel frames, and were used very little. Will furnish REBUILT, with A.C. and D.C. switchgear.

For additional information contact one of the following dealers closest to you.

T. B. MacCabe Company
4300 Clarissa Street, Philadelphia 40, Pa.
Morehead Electrical Machinery Co.
120 Noblestown Road, Oakdale (Pittsburgh District) Pennsylvania
Brazos Engineering Co., Inc.
P. O. Box 9114, Houston, Texas
Duquesne Electric & Mfg. Co.
6428 Hamilton Avenue, Pittsburgh 6, Pa.

For the Smoothest Paved Areas over Railroad Tracks . . .

Use **KASLE IMPROVED "Guardmaster" FLANGEWAY CROSSING GUARD**

Smooth Durable Crossings — Low Installation and Maintenance Cost. Write today for Brochure.

TRACKWORK of ALL KINDS

Rails of all sizes, Splice Bars, Bolts, Spikes, Tie Plates, Frog and Switch Materials, Tools, etc. Railroad Track Material inquiries invited.

KASLE STEEL CORPORATION
P. O. Box 536 • Detroit 32, Michigan • Tiffany 6-4200

HOT STRIP MILL

MAY BE SEEN IN OPERATION! Complete with Electrics, Motors, Drives, Furnaces, UpCoilers, Roughing & Finishing Stands. Capacity—36,000 Ton Per Month on Hot Rolled Steel. Suitable also for Stainless and Silicate Steel. Maximum Width—40"; Max. Thickness 6" down to .050.

Write Wire Phone

ARNOLD HUGHES COMPANY
2765 Penobscot Bldg., Detroit 26, Michigan WOodward 1-1894

PRESSES

#506 BLISS, S.S.S.C., Tie Rod, Eccentric Shaft, 6" stroke, air cushion, M.D.

#650 BLISS, S.S.S.C., Hi-Speed, Tie Rod, Flywheel, 2" stroke, roll feed, scrap cutter, automatic oiling, M.D.

#30C-24 CLEVELAND, Double Crank, Gap Frame, Flywheel, 5" stroke, automatic oiling, M.D.

POWER PRESS SPECIALISTS
471 North 5th St. Phila. 23, Pa.

FOR SALE
FREIGHT CAR REPAIR PARTS
RELAYING RAILS & ACCESSORIES
STEEL STORAGE TANKS
FRT. CARS & LOCOMOTIVES
CONTRACTOR EQUIP. & MACHINERY

THE PURDY CO.
8754 S. DOBSON AVE.
CHICAGO 19, ILL. — BA 1-2100
ALSO ST. LOUIS, MO., SAN FRAN. AND LONG BEACH, CALIF.

DIESEL LOCOMOTIVES
3—25 ton, 1—80 ton GE 42" ga.
1—18 ton, 1—30 ton Plymouth 36" ga.
1—65 & 25 ton GE Standard Gauge
3—25 ton Vulcan 30" ga.
ELEC. AIR COMPRESSORS
3—676 C.F.M.—Ing. Rand 40T 220/440
3—3170 C.F.M.—Ing. Rand PRE 2—500 HP
STANHOPE, 60 E. 42nd St., N. Y. 17, N. Y.

EST. 1904
DAVIDSON PIPE COMPANY INC.
ONE OF THE LARGEST STOCKS IN THE EAST
Seamless and Welded ⅛" to 26" O.D.
All wall thickness Manufactured.
Specialty large sizes.
Cutting — Threading — Flanging — Fittings — Valves.
Call GEdney 9-6300
50th St. & 2nd Ave., B'klyn 32, N. Y.

SALE OR RENT
1—D17,000 Caterpillar Power Plant.
1—25 ton G.E. Diesel Electric Locomotive.
1—100 ton G.E. Diesel Electric Locomotive.
1—1500 C.F.M. Chg. PNE. OGE Air Compressor.
3—1885 CFM Ingersoll-Rand XVH Air Compressors.
B. M. WEISS CO.
Girard Trust Bldg. Phila. 2, Pa.

Pre-Heat Furnace—Bar or Billet
Heating space 30' long, 36" wide, 15" high, 2200° F., gas fired, complete with all equipment and controls, excellent condition, price $15,000.00 where is in Los Angeles County.
GARDENA MACHINERY EXCHANGE
GARDENA, CALIF.
17710 S. Figueroa St. FAculty 1-0185

WORLD'S LARGEST STOCK STAMPING PRESSES
SQUARING SHEARS • PRESS BRAKES
REBUILT and GUARANTEED
WILL LEASE WITH OPTION TO PURCHASE, OR WILL FINANCE OVER LONG TERM
JOSEPH HYMAN & SONS
Tioga, Livingston & Almond Sts.
Philadelphia 34, Pa. Phone GArfield 3-8700

$2 per hour RENTS these 300-Ton PRESSES
Minster 40-8½, Air Clutch, Bed 37½x48"
Like new cond. Selling price $10,000.
Montgomery Engineering Company
1796 W. Phila., Detroit 6, Mich. TR 4-0929

GALVANIZE PLANT
44"x46"x13' 10" Pot—Fire Box Plate. Electric Elements, Switches and Transformers. Baskets and Hooks. Catalog and Price on Request.
PACIFIC AMERICAN COMMERCIAL CO.
P.O. Box 3742A — Seattle, Wash.

PIPE
VALVES and FITTINGS
All Sizes in Stock
NEW-USED
GREENPOINT PIPE SUPPLY CORP.
344 Stagg Street Brooklyn 6, N.Y.

OVERHEAD ELECTRIC CRANE

10-ton P. & H., 96'3" span, 230-VDC, 35' lift, suitable for outdoor service.

M.E.T. Equipment and Construction Co.
4310 Clarissa Street Phila. 40, Pa.
Phone—DA 4-8300

FOR IMMEDIATE SALE

Complete Structural Steel Clear Span Storage Building with O.E.T. a.c. GRAB BUCKET CRANE.

Building

80' x 220' with 15' roof truss continuation overhang each side, approx. 30' under truss.

Crane

Bridge: 80', 30 ton cap., with 50 HP high speed travel motor.

Trolley: Milwaukee, (new 1953) with 2—11 ton high speed hoist drums, each powered by 125 HP motor, and 1—15 HP motor for high speed trolley travel.

Electrics: 3/60/440—magnetic control.

Will sell building and crane as a unit or separately.

PHILADELPHIA TINPLATE CO., Inc.
Philadelphia 25, Pa. GArfield 6-5150

MOTORS AND GENERATORS

1500 HP D.C. MOTORS

1500 HP—525 volts D. C.—600 R.P.M.—NEW—2-bearing continuous duty motors—manufactured by Westinghouse. In original crates. From Navy Destroyer Escort. SPECIFICATIONS: 2-bearing 1500 HP—525 volts DC—2270 amps—600 RPM—ambient temperature 40 C—class B insulation—2-bearing pedestal sleeve type—shunt wound—efficiency 94.23%. ONLY 6 AVAILABLE—BUY NOW AND SAVE. Suitable for steel mill drive—offshore oil rigs—rolling mill drive—dredge pump applications.

1200 KW GENERATORS

(2) Equal to new—manufactured by Allis-Chalmers. 1200 KW—525 volts D.C.—2290 amps—750 RPM—cooling self-ventilated—totally enclosed—separate excitation—continuous duty—class B insulation—mfg. type M.H.C.—frog leg armature.

THE BOSTON METALS CO.
313 E. Baltimore St. Baltimore 2, Md.
ELGIN 7-5050 LEXINGTON 9-1900

FOR SALE

COMPLETE BAR & ROD ROLLING MILL IMMEDIATELY AVAILABLE

Suitable for Rolling Steel or Copper billets down to bar or rod sizes, including hotbed, shears, and rod coiler.

STILL SET-UP, REASONABLY PRICED FOR IMMEDIATE SALE

NATIONAL MACHINERY EXCHANGE
126 Mott St. New York 13, N. Y.
CAnal 6-2470

WHEELABRATOR cabinet with work car for shot peening will handle work 3' to 6'.

WHEELABRATOR cabinet for ARMOR PLATES up to 30'

WHEELABRATOR cabinet for PIPES, TUBES, STRIPS, TANKS.

WHEELABRATOR TUMBLAST 36" to 42".

SAND BLASTING TANKS, CABINETS; SUCTION, VACUUM VAPOR BLAST EQUIPMENT; DUST COLLECTORS; TENSILE TESTERS; HARDNESS TESTERS.

M. ELSTEIN
426 Grand St., Jersey City 2, N. J.

LOCK SEAM TUBE, INC.
MONTGOMERYVILLE, PA.

Manufacturers of Lock Seam Tubing & Rolled Metal Shapes

FOR LEASE
Factory Buildings—San Diego

20,000 sq. ft. on 4 acres. Will build to suit. All utilities. Rail Road spur. Owner wishes to buy stock in Co. taking lease. Modern plating plant occupies part of property. Mfg. of product which requires plating ideal. Brokers welcome.
Write A. E. Heflin 3145 D. Ave.
National City, California.

Find that machine you are looking for in the CLEARING HOUSE

CONTRACT MANUFACTURING

Special Washers

We carry in stock Silicon killed steel specially suited for case-hardening. Stock dies for producing washers from .0015 to ½" thick.

Thomas Smith Company
294 Grove St., Worcester, Mass.

SPECIAL MACHINERY

DIAMITE *Abrasive Resistant* Castings
NI-RESIST *Heat & Corrosion Resistant* Castings
P M G BRONZE *High Strength Acid Resistant* Castings
Fully Equipped—Pattern Foundry & Machine Shop Facilities—Castings to 15 tons.
Weatherly Foundry & Mfg. Co., Weatherly, Pa.

DROP FORGE DIES

Forging Engineers—Die Sinkers—Manufacturers of drop forge dies and hot work tools for presses and upsetters.

COMMERCIAL DIE COMPANY
7851 Intervale Ave., Detroit 4, Mich.
Phone: WEBSTER 3-7104 Cable Code "Comdie"

DROP FORGINGS

Special Forgings of Every Description. We solicit your prints or model for quotation.

Wilcox Forging Corporation
Mechanicsburg Penna.

MEEHANITE® METAL CASTINGS

ROUGH OR MACHINED
ONE TO 60,000 POUNDS
FOR
STRENGTH — ABRASION
CORROSION OR HEAT

ROSEDALE FOUNDRY & MACHINE CO.
1735 PREBLE AVE., PITTSBURGH 33, PA.

Let us quote on STAMPINGS and ASSEMBLIES from drawing or sample

Drilling . . . Blanking . . . Riveting . . . Forming . . . Tapping . . . Welding . . . Toolmaking of course

COMPLETE DESIGN AND DEVELOPMENT FACILITIES

HUEBEL MFG. CO., INC.
763 Lexington Ave. Kenilworth, N. J.

Nepsco

NEW ENGLAND PRESSED STEEL COMPANY

Contract Manufacturer since 1914

METAL STAMPINGS
SPECIALTIES — APPLIANCES

For Industrial and Domestic Users

P. O. BOX 29
NATICK MASSACHUSETTS

DROP FORGINGS

To Your Specifications
Prompt Quotations

BALDT ANCHOR CHAIN & FORGE DIVISION
P. O. Box 350—Chester, Pennsylvania

Gray Iron and Semi Steel Castings, also alloyed with nickel, chrome, and molybdenum. Wood and Aluminum pattern work.

KING FOUNDRIES, INC.
Phone 823 North Wales, Montg. Co., Pa.
22 Miles from Philadelphia, Pennsylvania

DROP FORGINGS

SINCE 1895

Small drop forgings up to one pound in size. Inquiries invited for very prompt action.

KEYSTONE FORGING COMPANY

Northumberland Pennsylvania GReenwood 3-3525

OLSON

SCREW MACHINE PRODUCTS

Made to your specifications and tolerances. From smallest up to 2⅝" diameter in steel, brass and aluminum.

OLSON MANUFACTURING CO.

101 Prescott Street Worcester, Mass.

PIT-MOLDED CASTINGS

. . . a specialty in our MEEHANITE® foundry. We can handle any size casting from 5 to 26,000 pounds, rough or machined to your specifications. (MEEHANITE® properties lie between cast iron and steel.)

Our shops are also equipped for:

- LARGE PATTERN MAKING
- HEAVY PLATE STEEL FABRICATION
- MACHINE SHOP FACILITIES
- PRODUCTION AND ASSEMBLY OF CUSTOM-BUILT MACHINERY

HARDINGE MANUFACTURING CO.

240 Arch Street York, Pennsylvania

Phone 33821

THE FORMULA:

Multi-operation presses
plus
Yankee skilled workmen
over
Eighty years manufacturing know-how equals
Low cost metal stampings
And precision assemblies
To meet your needs

The GREIST MANUFACTURING CO.

646 Blake St., New Haven 15, Conn.

SPINNING SERVICE

Let us quote on your spinning needs. ASME flanged and dished heads formed. Sizes available range from 24 inch to 11 foot six inch. Can spin up to 8 gauge either stainless or carbon steel.

WALKER STAINLESS EQUIPMENT CO., Inc.

Elroy, Wisconsin

STA-FAST STEEL WEDGES

sharp edges give holding power like a screw.

Self-Aligning Steel Belt Fasteners.

Standard Steel Rivets used with Self-Aligning Fasteners.

STAMPINGS PUNCHINGS WASHERS

to your specifications

Catalog sent upon request

SALING MANUFACTURING COMPANY

Standard-Belt-Fastener Division

UNIONVILLE, CONNECTICUT

DROP FORGINGS

Special Forgings—High Quality, Fast Delivery. For prompt attention phone or send prints to John Bello.

CARCO INDUSTRIES, INC.

7341 Tulip Street, Phila. 35, Pa.

DEvonshire 2-1200

WELDED or RIVETED

STEEL PLATE FABRICATION

- Gas Seal Hoods for Blast Furnaces
- Furnace Roof Rings
- Cinder Cooling Cars
- Billet Cars
- Ingot Cars
- Ladle Cars
- Hopper Cars
- Gondola Cars
- Heavy Truck Bodies
- Boiler Casings
- Boiler Breechings
- Flues and Ducts
- Condenser Shells
- Condenser Piping
- Heavy Turbine Housings
- Hoppers and Bunkers
- Tanks and Vats
- Pressure Vessels
- Wind Tunnels
- Crane Bridge Girders
- Trolley Frames and Trucks
- Rigid Frames
- Roll-Over Fixtures
- Engine Frames and Bases
- Crawler Frames
- Press Platens and Beds
- Press Columns
- Heavy Machinery Parts and Assemblies
- Design Conversion of Castings to Weldments

MACHINING

- Complete Machining Service—Facilities for Heavy Work of Unusual Dimensions

THE R. C. MAHON COMPANY

DETROIT 34, MICHIGAN

Branch Offices in New York and Chicago

MAHON

EQUIPMENT AND MATERIALS WANTED

WANTED
NEW SURPLUS STEEL USED
Structurals, Plate, Pipe and Tubing
Consumers Steel & Supply Co.
P. O. Box 270, RACINE, WISCONSIN

DRAW BENCHES (2)
Wanted 100,000# to 200,000# capacity without mandril equipment. Used in good condition. Advise full particulars.
ADDRESS BOX G-697
Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39

WANTED
SURPLUS STEEL
WALLACK BROTHERS
7400 S. Damen Ave. Chicago 36, Illinois

WEISS STEEL CO. INC.
600 WEST JACKSON BLVD.
CHICAGO 6, ILLINOIS
Buyers of Surplus Steel Inventories
28 Years of [illegible]

WANTED
BRIDGE CRANES
ARNOLD HUGHES COMPANY
2765 PENOBSCOT BLDG. DETROIT, MICH.
WOodward 1-1894

To Locate
a source of supply for that "Hard-to-Find" material
try the
WANTED SECTION

EMPLOYMENT EXCHANGE

REPRESENTATIVES WANTED

SALES REPRESENTATION
Wanted: Nationally known Electric Welded Steel Tube Producer has opening for sales representative in Oklahoma and Texas area.
ADDRESS BOX G-698
Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39

SALES REPRESENTATION
Wanted: Nationally known Electric Welded Steel Tube Producer has opening for sales representative in southeastern states.
ADDRESS BOX G-699
Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39

HELP WANTED

EXPERIENCED MISCELLANEOUS AND ORNAMENTAL IRON ESTIMATOR or detailer to take complete charge of drafting department, including all purchasing and expediting. Please give complete resume of experience, age, and salary expected in first reply. Address G-695, Care *The Iron Age*, Chestnut & 56th Sts., Philadelphia 39.

EMPLOYMENT SERVICE

HIGH GRADE MEN — Salaries $5,000 to $25,000. Since 1915 thousands of Manufacturing Executives, Engineers, Sales Managers, Comptrollers, Accountants, and other men of equal calibre have used successfully our confidential service in presenting their qualifications to employers. We handle all negotiations. Submit record with inquiry. The National Business Bourse, 20 W. Jackson Blvd., Chicago 4.

SITUATION WANTED

MACHINE SHOP FOREMAN—Age 32. 12 years' experience in jobbing and production. Have complete knowledge of production methods, and meeting production schedules. Ability to handle men without labor disputes. Best of references. Address Box G-700, Care *The Iron Age*, Chestnut & 56th Sts., Philadelphia 39.

Do you have . . .
A JOB FOR THE RIGHT MAN?
Are you . . .
THE RIGHT MAN FOR THE JOB?
Employers and men qualified for positions in the metalworking industry get together in the
Employment Exchange of
THE IRON AGE

BUSINESS OPPORTUNITIES

LOCATION—CAMDEN, N. J.
A Great Buy—Ready to Occupy

INDUSTRIAL PLANT

28 ACRES — 350,000 SQ. FT.
6 MAIN 1-STORY BUILDINGS

Steel & Brick. Unrestricted.

880' L.x133' W.x46' H.
800' L.x108' W.x40' H.
540' L.x168' W.x40' H.
475' L.x90' W.x33' H.
270' L.x45' W.x50' H.
120' L.x60' W.x83' H.

- Steam & Electric Power
- Plentiful water supply and sewage
- Railroad sidings
- Ample parking area
- Good labor supply
- Low insurance

Above with overhead cranes, 10 to 120 tons

CAMDEN FORGE CO.
P. O. Box 269, Hoboken, N. J.
New York Phone: BA 7-0600

THE IRON AGE
Chestnut & 56th Sts.
Philadelphia 39, Pa.

Please send me rates and general information about the Clearing House Section without obligation on my part.

Firm.....

City.....Zone.....

State.....

Name.....Title.....

ADVERTISERS IN THIS ISSUE

An asterisk beside the name of advertiser indicates that a booklet, or other information, is offered in the advertisement. Write to the manufacturer for your copies today.

A

*Abell-Howe Company 87
*Air Reduction Sales Co. 22
*Allied Research Products, Inc. .. 112
*Allis-Chalmers Mfg. Co. 63
*American Brass Co., The 79
American Optical Co. 40
American Smelting & Refining Co. Continuous-Cast Products Department 39
American-Standard Ross Heat Exchanger Division 137
Arcos Corp. .....120 & 121
*Armco Steel Corp. .....24 & 25
*Armstrong-Blum Manufacturing Co. 76
*Armstrong Bros. Tool Co. 124
*Associated Spring Corp. 19

B

Baker, J. E., Co., The 36
Baldt, Anchor, Chain & Forge Div. 160
Baldwin-Lima-Hamilton Corp. Standard Steel Works Division 26
*Barksdale Valves 127
Barnes-Gibson-Raymond, Inc., Div. Associated Spring Corp. 19
Barnes, Wallace, Co., Div. Associated Spring Corp. 19
Barnes, Wallace, Steel Division, Associated Spring Corp. 19
Belyea Co., Inc. 156
Bertsch & Company 164
Bethlehem Steel Co. 1
Birdsboro Steel Fdry. & Machine Co. 119
*Boston Gear Works 35
Boston Metals Company .....157 & 160
Bound Brook Oil-Less Bearing Co. 61
Brainard Steel Div., Sharon Steel Corp. 83
Bristol Brass Corp., The 64
Bullard Co., The 70

C

*Cambridge Wire Cloth Co., The 132
Camden Forge Co. 162
Carco Industries, Inc. 161
Carpenter Steel Co., The, Alloy Tube Division 37
Cattie, Joseph P., & Bros 163
Cincinnati Milling Machine Co., The, Cincinnati Milling Products Div. 69
*Cities Service Oil Co. 38
*Clark Controller Co., The 5
*Cleveland Worm & Gear Co. 50
Colorado Fuel & Iron Corp., The Wickwire Spencer Steel Div. .. 31
Commercial Die Co. 160
Consumers Steel & Supply Company 162
Continental Screw Co. 85
*Cowles Tool Co. 139
Cox & Sons Co., The 159
Cromwell Paper Co. 66
Crucible Steel Casting Co. 155

D

Darco Industries, Inc., Flotrusion, Inc., Div. 11
Davidson Pipe Co., Inc. 159
Davis Keyseater Co. 164
Decatur Casting Co. 82
*De Laval Steam Turbine Company 43
*Dempster Brothers, Inc. 129
*Detroit Steel Corp. 72
De Vlieg Machine Co. .....14 & 15
Dravo Corporation .....88 & 89
Dunbar Bros. Co., Div., Associated Spring Corp. 19
Duraloy Co., The 133
Dykem Company, The 164

E

Eastern Machinery Co., The ... 158
Electric Steel Foundry Company 33
Elstein, M. 160
Erie Foundry Co. 4
*Euclid Crane & Hoist Co., The 155

F

Falk Machinery Co. 157
Flotrusion, Inc., A Division of Darco Industries Inc. 11
Foote Bros. Gear & Machine Corp. 86
Foster, Frank B., Inc. 158
Foster, L. B., Company 10
Frank, M. K. 157

G

Gardena Machinery Exchange .. 159
Gibson, Wm. D., Co., Div., Associated Spring Corp. 19
Goss & DeLeeuw Machine Co. ... 163
Greenpoint Pipe Supply Corp. 159
Greist Mfg. Co., The 161

H

Hardinge Mfg. Co. 161
Harrison Sheet Steel Co. 164
Hayward Company, The 164
Heflin, A. E. 160
Hendrick Manufacturing Co. ... 124
Henry, A. T., & Company, Inc... 157
Hewitt-Robins 125
Huebel Mfg. Co., Inc. 160
Hughes, Arnold, Co. 158-159-162
Hyde Park Foundry & Machine Co. 108
Hyman, Joseph, & Sons 159

I

Industrial Services 158
Inland Steel Co. 134
Iron & Steel Products, Inc. 156

J

*Jessop Steel Company 17

K

Kaste Steel Corp. 159
Keystone Forging Co. 161
King Foundries, Inc. 160

L

Lang Machinery Co. 158
*Lawrence Warehouse Company . 109
Lock Seam Tube 160
*Lodge & Shipley Co., The 18
*Logan Co. 118
Luria Bros. & Co., Inc. 143

M

M.E.T. Equipment & Construction Co. 160
MacCabe, T. B., Co. 157-159
*MacLeod Co., The 155
*Magnaflux Corporation 107
Mahon, R. C., Co., The 141
Mesta Machine Co. Inside Front Cover
Miles Machinery Co. 157
Moltrup Steel Products Co. 127
Montgomery Engineering Company 159

N

National Acme Co., The .....46 & 47
National Business Bourse, Inc. ... 162
National Forge & Ordnance Co. 141
National Machinery Co. ...28 & 29
National Machinery Exchange ... 160
National Steel Corp. 41
*New Departure Div., General Motors Corp. 48
New England Pressed Steel Co. . 160
*Niagara Blower Co. 117
*Northern Engineering Works ... 110

O

Olson Manufacturing Co. 161

P

Pacific American Commercial Co. 159
Peterson Steels, Inc. 13
Philadelphia Tinplate Co., Inc. 160
Pittsburgh Steel Co. .....44 & 45
Platt Bros. & Co., The 164
*Poole Foundry & Machine Co. .. 164
Power Press Specialists 159
Pratt & Whitney Co., Incorporated .....122 & 123
*Prenco Products, Inc. 16
Purdy Company, The 159

Q

Quaker State Metals Company .. 80

R

Raymond Manufacturing Co., Div. Associated Spring Corp... 19
*Republic Steel Corp. ....20 & 21
*Robbins & Myers, Inc., Crane & Hoist Div. 32
*Rolled Alloys, Inc. 84
Rosedale Foundry & Machine Co. 160
*Ross Heat Exchanger Division, American-Standard 137

S

Saling Manufacturing Company.. 161
Sharon Steel Corp. 6
*Shepard Niles Crane & Hoist Corp. 145
Smith, Thomas Co. 160
Southern Screw Co. 9
*Spencer Turbine Company, The . 130
*Sperry Products, Inc. 111
Standard Steel Works Div., The Baldwin-Lima-Hamilton Corp... 26
Stanhope, R. C., Inc. 159
*Star Cutter Company 8
Superior Steel Division of Copperweld Steel Company 115

T

Taylor-Winfield Corporation ... 153
*Tempil Corporation 82
*Thomson, Judson L., Mfg. Co. .. 30
Titanium Alloy Mfg. Division, National Lead Company 90
Torrington Co., The 116

U

*United Air Lines 23
*United States World Trade Fair 27
Universal Machinery & Equipment Co. 158

V

Valley Mould & Iron Corp. 74
Vanadium Corp. of America ... 42
Verson Allsteel Press Co. Back Cover

W

Walker Stainless Equipment Co., Inc. 161
Wallack Bros. 162
Weatherly Foundry & Mfg. Co. .. 160
*Webb Corp., The 131
*Weirton Steel Co. 41
Weiss, B. M., Co. 159
Weiss Steel Co., Inc. 162
*Whiting Corporation 12
Wickwire Spencer Steel Div., The, Colorado Fuel & Iron Corp. .. 31
Wilcox Forging Corp. 160
Wilson, Lee, Engineering Co., Inc. .....Inside Back Cover

Y

Youngstown Sheet & Tube Co., The 34

CLASSIFIED SECTION

Business Opportunities 162
Clearing House 156-160
Contract Manufacturing 160-161
Employment Exchange 162
Equipment & Materials Wanted 162

GOSS and DE LEEUW
MULTIPLE SPINDLE
CHUCKING MACHINES
Four, Five, Six, Eight Spindles • Work and Tool Rotating Type
GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN.

HOT DIP GALVANIZING
JOSEPH P. CATTIE & BROTHERS, INC.
2520 East Hagert St.
Phone: Re 9-8911 **Phila. 25, Pa.**

Here's the finest hook-on bucket you can get—with extra

BUCKET STAMINA
LOAD CAPACITY
DIGGING POWER

Foundries, steel mills, power plants — all acclaim this Hayward Electric Clam-Shell as the finest hook-on bucket obtainable. Handles extra large loads safely. Notable for giving many years' service with minimum maintenance. Interchangeable with your electric magnet. The Hayward Company, 50 Church St., New York 7, N. Y.

HAYWARD BUCKETS

CLAM SHELL • ELECTRIC • ORANGE PEEL • GRAPPLES
famous for performance since 1888

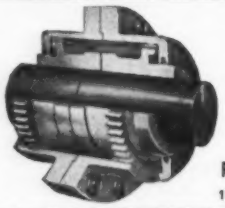
Formed steel bridge rails

WE HAVE STEEL AND PRESSES --- for making these sections in lengths up to 20'..... steel up to ½" thick!

MAY WE BID ON YOUR REQUIREMENTS

HARRISON SHEET STEEL CO.
4718 W. FIFTH AVENUE CHICAGO 44

Z I N C
STRIP AND WIRE
ZINC METALLIZING WIRE
ZINC ACCURATELY ROLLED
for electric fuse elements
THE PLATT BROS. & CO., WATERBURY 20, CONN.



POOLE
FLEXIBLE COUPLINGS
ALL SIZES AND TYPES
CATALOG ON REQUEST
POOLE FOUNDRY & MACHINE CO.
1700 UNION AVE., BALTIMORE 11, MD.

"DAVIS" KEYSEATER
Low in Cost. Durable. Easy to operate.
Table adjustable for straight or taper keyways
Two sizes. Keyways 1/16" up to 1".
DAVIS KEYSEATER CO. • 1239 University Ave. ROCHESTER 8, N. Y.

DYKEM STEEL BLUE
Stops Losses making Dies and Templates

Popular package is 8-oz. can fitted with Bakelite cap holding soft-hair brush for applying right at bench; metal surface ready for layout in a few minutes. The dark blue background makes the scribed lines show up in sharp relief, prevents metal glare. Increases efficiency and accuracy.

Write for sample on company letterhead
THE DYKEM COMPANY
2303G North 11th St. • St. Louis 6, Mo.

CUT SCRAPER TIME
END NIGHT CLEANUP & MORNING REBLUING

DYKEM HI-SPOT BLUE No. 107 is used to locate high spots when scraping bearing surfaces. As it does not dry, it remains in condition on work indefinitely, saving scraper's time. Intensely blue, smooth paste spreads thin, transfers clearly. No grit; noninjurious to metal. Uniform. Available in collapsible tubes of three sizes. Order from your supplier. Write for free sample tube on company letterhead.
THE DYKEM CO., 2303G NORTH 11TH ST., ST. LOUIS 6, MO.

INITIAL PINCH TYPE PLATE BENDING ROLL
Capacity 1½" X 10'

Our Line
Light and heavy machinery for all classes of sheet metal, plate and structural work

BERTSCH & COMPANY, CAMBRIDGE CITY • INDIANA

FROM WRAPPER TO CORE...

Lee Wilson assures you absolute uniformity

Because Lee Wilson has developed methods for getting the heat to the coil faster, the entire coil reaches annealing temperature more quickly. Inner wrappings of the coil thus get the same amount of heat for the same period of time as the outermost wrappings. This means that every foot of every coil has been subjected to the same condition. What's more, Lee Wilson engineers have developed a simplified remote control that makes sure the heat is directed to the correct areas every moment of the annealing period, without periodic manual furnace adjustment.

Uniformity is necessary to good annealing. If you're concerned with the quality of your product, why not talk with Lee Wilson engineers soon?

Lee Wilson* ENGINEERING COMPANY, INC.

20005 WEST LAKE ROAD • CLEVELAND 16, OHIO

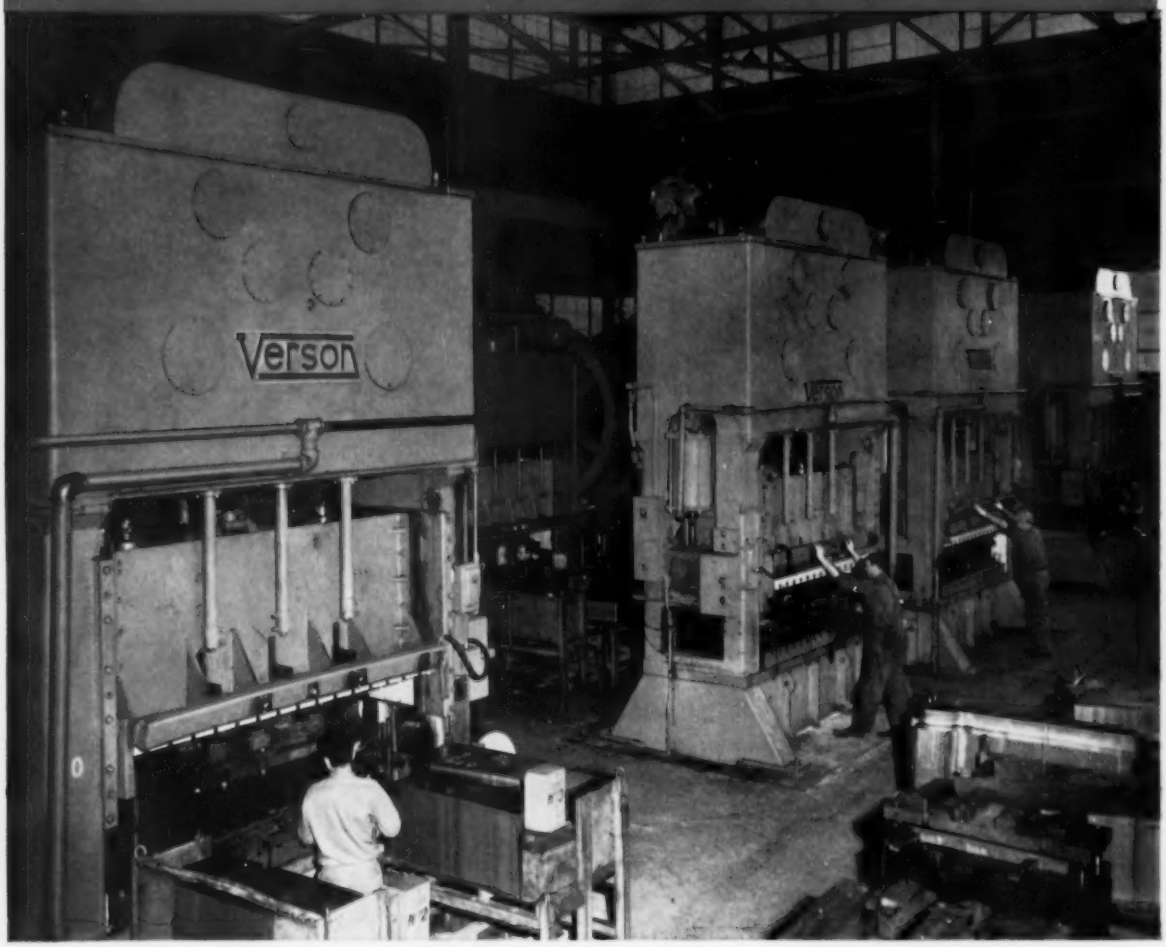
SINGLE-STACK RADIANT TUBE ANNEALING FURNACES

MAKE THE BEST METALS BETTER

* ORIGINATORS AND LEADING PRODUCERS OF SINGLE-STACK RADIANT TUBE FURNACES

501

To make manufacturing more efficient . . . more profitable . . .



Another versatile production process engineered and developed by Verson

To achieve a more efficient, more flexible metal-working plant, Lobdell-Emery Mfg. Co., Alma, Michigan, recently installed these four Verson 250 ton eccentric presses.

Used as individual units, the machines are employed for blanking, drawing and forming operations on a variety of parts. In operation as a production process, the four units are utilized for the fabrication of station wagon panels. Primary production is on seat backs and cushions and floor panels for a major automotive manufacturer.

The four machines are identical. Each has a capacity of 250 tons with slide and bolster area measuring 48" x 96". Operating speed is 25 SPM.

If versatility of operation is one of your aims . . . and more profitable production essential, look into the Verson concept . . . "Anyone can build a press . . . Verson builds production processes."

182-C

A Verson Press for every job from 60 tons up.

Verson

ORIGINATORS AND PIONEERS OF ALLSTEEL STAMPING PRESS CONSTRUCTION

VERSON ALLSTEEL PRESS CO.

9314 S. KENWOOD AVENUE, CHICAGO 19, ILLINOIS • 8300 S. CENTRAL EXPRESSWAY, DALLAS, TEXAS

MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES • TOOLING • DIE CUSHIONS • VERSON-WHEELON HYDRAULIC PRESSES